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DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 311

SURFACE WATER SUPPLY OF THE UNITED STATES

1911

PART XI. PACIFIC COAST IN CALIFORNIA

PREPARED UNDER THE DIRECTION OF M. O. LEIGHTON

BY

H. D. McGLASHAN AND R. H. BOLSTER

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Annual appropriations for the fiscal year ending June 30—

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000
1911	150,000

In the execution of the work various private and State organizations have cooperated. Acknowledgments for such cooperation is made on page 18, and also in connection with the description of each station affected by the cooperative work.

PUBLICATIONS.

Measurements of stream flow have been made at nearly 2,000 points in the United States and also at many points in small areas in Seward Peninsula and the Yukon-Tanana region, Alaska, and in the Hawaiian Islands. During 1911 gaging stations were maintained by the Survey and the cooperating organizations at about 1,500 points in the United States, and many discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country, and will be made available in the regular surface water-supply papers from time to time. A complete list of the gaging stations maintained by the Survey to and including 1910 and a list of the papers relating to the water supply of the country has been published by the Survey as Water-Supply Paper 280. An index to the reports containing stream flow measurements prior to 1904 has been published as Water-Supply Paper 119.

Plates I and II show the average run-off and rainfall in the United States as determined from the measurements of stream flow made by the Geological Survey and records of rainfall collected by the Weather Bureau.

For each calendar year there has been prepared a report embodying the stream-flow data collected during that year, which has been published either as a part of the annual report of the Director, as a bulletin, or as a water-supply paper, as shown by the following table:

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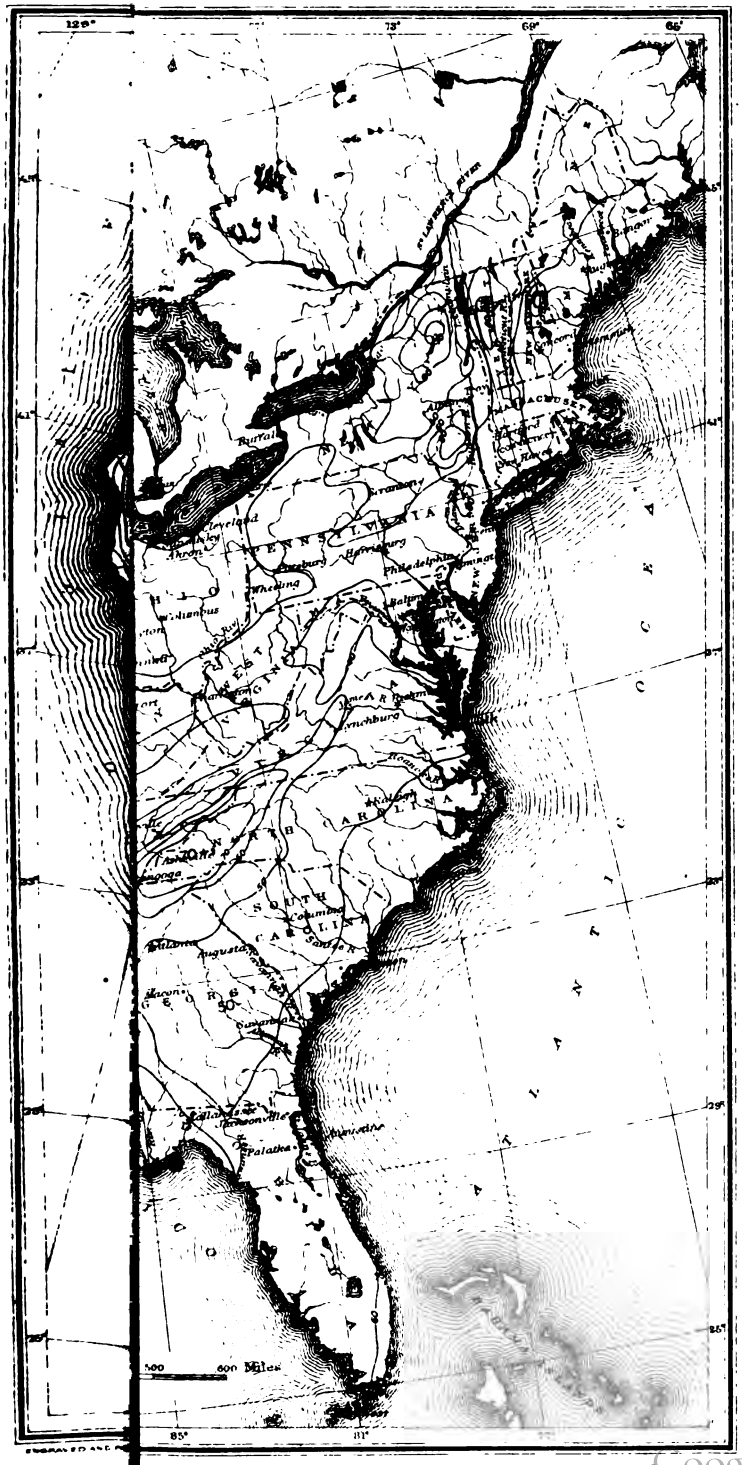

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Prepared by Henry Gannett
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and United States Weather Bureau

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SURFACE WATER SUPPLY OF THE PACIFIC COAST IN CALIFORNIA, 1911.

By H. D. McGLASHAN and R. H. BOLSTER.

AUTHORITY FOR INVESTIGATIONS.

This volume is Part XI of a series of 12 reports presenting results of measurements of flow made on certain streams in the United States during the calendar year 1911. The reports are listed in the following table:

Papers on surface water supply of the United States, 1911.

Part.[a]	No.	Title.
I	301	North Atlantic coast.
II	302	South Atlantic coast and eastern Gulf of Mexico.
III	303	Ohio River basin.
IV	304	St. Lawrence River basin.
V	305	Upper Mississippi River and Hudson Bay basins.
VI	306	Missouri River basin.
VII	307	Lower Mississippi River basin.
VIII	308	Western Gulf of Mexico.
IX	309	Colorado River basin.
X	310	Great Basin.
XI	311	Pacific coast in California.
XII	312	North Pacific coast.

[a] For the purpose of uniformity in the presentation of reports, a general plan has been agreed upon by the United States Reclamation Service, the United States Forest Service, the United States Weather Bureau, and the United States Geological Survey, according to which the area of the United States has been divided into 12 parts, whose boundaries coincide with natural drainage lines indicated by the parts of the report.

The data presented in these reports were collected by the United States Geological Survey under authority implied in the organic law (20 Stat. L., p. 394), which contains the following paragraph:

Provided, That this officer [the Director] shall have the direction of the geological survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies of water supply for irrigation.

Since the fiscal year ending June 30, 1895, successive sundry civil bills passed by Congress have carried the following item and appropriations:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods of utilizing the water resources.

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Annual appropriations for the fiscal year ending June 30—

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000
1911	150,000

In the execution of the work various private and State organizations have cooperated. Acknowledgments for such cooperation is made on page 18, and also in connection with the description of each station affected by the cooperative work.

PUBLICATIONS.

Measurements of stream flow have been made at nearly 2,000 points in the United States and also at many points in small areas in Seward Peninsula and the Yukon-Tanana region, Alaska, and in the Hawaiian Islands. During 1911 gaging stations were maintained by the Survey and the cooperating organizations at about 1,500 points in the United States, and many discharge measurements were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country, and will be made available in the regular surface water-supply papers from time to time. A complete list of the gaging stations maintained by the Survey to and including 1910 and a list of the papers relating to the water supply of the country has been published by the Survey as Water-Supply Paper 280. An index to the reports containing stream flow measurements prior to 1904 has been published as Water-Supply Paper 119.

Plates I and II show the average run-off and rainfall in the United States as determined from the measurements of stream flow made by the Geological Survey and records of rainfall collected by the Weather Bureau.

For each calendar year there has been prepared a report embodying the stream-flow data collected during that year, which has been published either as a part of the annual report of the Director, as a bulletin, or as a water-supply paper, as shown by the following table:

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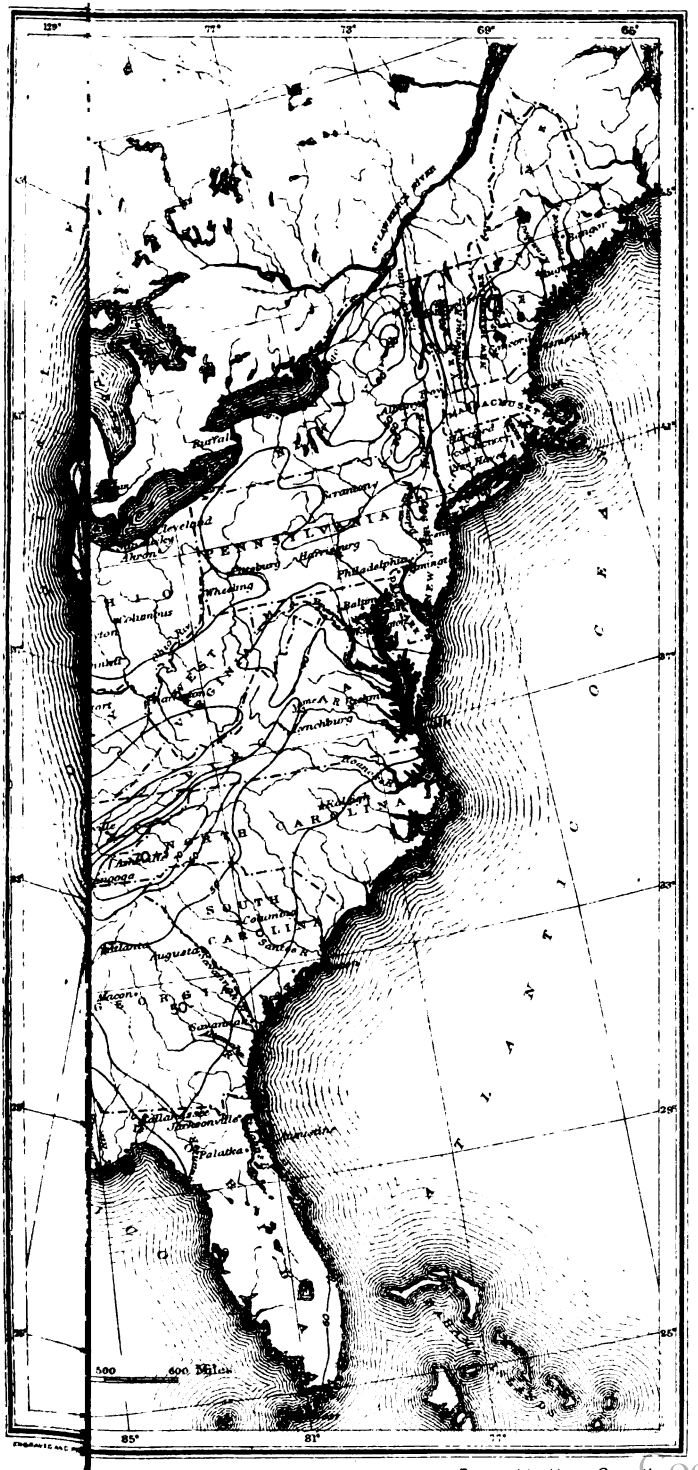

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Prepared by Henry Gannett
mainly from data of the
United States Geologic
and United States We

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U. S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

MAP OF UNITED ST

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Stream-flow data in reports of the United States Geological Survey.

[A=Annual Report; B=Bulletin; WS=Water-Supply Paper.]

Report.	Character of data.	Year.
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge	1884 to Sept., 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
WS 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
WS 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
WS. 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
WS 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
WS 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
WS 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
WS 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
WS 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
WS 75	Monthly discharge	1901.
WS 82 to 85	Complete data	1902.
WS 97 to 100	do	1903.
WS 124 to 135	do	1904.
WS 165 to 178	do	1905.
WS 201 to 214	Complete data, except descriptions	1906.
WS 241 to 252	Complete data	1907–8.
WS 261 to 272	do	1909.
WS 281 to 292	do	1910.
WS 301 to 312	do	1911.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The table which follows gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1911. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1911, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, and 301, which contain records for the New England streams from 1903 to 1911.

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Numbers of water-supply papers containing results of stream measurements, 1899–1911.

	1899 [a]	1900 [b]	1901	1902	1903	1904
North Atlantic coast (St. John River to York River)	35	47, [c] 48	65, 75	82	97	[d] 124, [e] 125, [f] 126
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[g] 35, 36	48	65, 75	[g] 82, 83	[g] 97, 98	[f] 126, 127
Ohio River basin	36	48, [h] 49	65, 75	83	98	128
St. Lawrence River and Great Lakes	36	49	65, 75	[i] 82, 83	97	129
Hudson Bay and upper Mississippi River	36	49	[j] 65, 66, 75	[j] 83, 85	[j] 98, 99, 100	[j] 128, 130
Missouri River	[k] 36, 37	49, [l] 50	66, 75	84	99	130, [m] 131
Lower Mississippi River	37	50	[j] 65, 66, 75	[j] 83, 84	[j] 98, 99	[j] 128, 131
Western Gulf of Mexico	37	50	66, 75	84	99	132
Colorado River	[n] 37, 38	50	66, 75	85	100	133
Great Basin	38, [p] 39	51	66, 75	85	100	133, [q] 134
Pacific coast in California	38, [r] 39	51	66, 75	85	100	134
North Pacific coast	38	51	66, 75	85	100	135

	1905	1906	1907–8	1909	1910	1911
North Atlantic coast (St. John River to York River)	[d] 165, [e] 166, [f] 167	[d] 201, [e] 202, [f] 208	241	261	281	301
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[f] 167, 168	[f] 203, 204	242	262	282	302
Ohio River basin	169	205	243	263	283	303
St Lawrence River and Great Lakes	170	206	244	264	284	304
Hudson Bay and upper Mississippi River	171	207	245	265	285	305
Missouri River	172	208	246	266	286	306
Lower Mississippi River	[j] 169, 173	[j] 205, 209	247	267	287	307
Western Gulf of Mexico	174	210	248	268	288	308
Colorado River	175, [o] 177	211	249	269	289	309
Great Basin	176, [q] 177	212, [q] 213	250, [q] 251	270, [q] 271	290	310
Pacific coast in California	177	213	251	271	291	311
North Pacific coast	[s] 177, 178	214	252	272	292	312

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39.
[b] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52.
[c] Wissahickon and Schuylkill rivers to James River.
[d] New England rivers only.
[e] Hudson River to Delaware River, inclusive.
[f] Susquehanna River to Yadkin River, inclusive.
[g] James River only.
[h] Scioto River.
[i] Lake Ontario and tributaries to St. Lawrence River proper.
[j] Tributaries of Mississippi from east.
[k] Gallatin River.
[l] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[m] Platte and Kansas rivers.
[n] Green and Gunnison rivers and Grand River above junction with Gunnison.
[o] Below junction with Gila.
[p] Mohave River only.
[q] Great Basin in California, excepting Truckee and Carson drainage basins.
[r] Kings and Kern rivers and south Pacific coast drainage basins.
[s] Rogue, Umpqua, and Siletz rivers only.

DEFINITION OF TERMS.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups: (1) Those which represent a rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile; and (2) those which represent the actual quantity of water, as run-off in depth in inches and acre-feet. The units used in this series of reports are second-feet, second-feet per square mile, run-off in inches and acre-feet. They may be defined as follows:

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"Second-feet" is an abbreviation for cubic feet per second and is the unit for the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at a rate of 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the following table of equivalents.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

An "acre-foot" is equivalent to 43,560 cubic feet, and is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage for irrigation work.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge (second-feet per square mile).	Run-off (depth in inches).				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	0.03719	1.041	1.079	1.116	1.153
2.....	.07438	2.083	2.157	2.231	2.306
3.....	.11157	3.124	3.236	3.347	3.459
4.....	.14876	4.165	4.314	4.463	4.612
5.....	.18595	5.207	5.393	5.578	5.764
6.....	.22314	6.248	6.471	6.694	6.917
7.....	.26033	7.289	7.550	7.810	8.070
8.....	.29752	8.331	8.628	8.926	9.223
9.....	.33471	9.372	9.707	10.041	10.376

NOTE.—For partial month multiply the values for one day by the number of days.

Table for converting discharge in second-feet into run-off in acre-feet.

Discharge (second-feet).	Run-off (acre-feet).				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	1.983	55.54	57.52	59.50	61.49
2.....	3.967	111.1	115.0	119.0	123.0
3.....	5.950	166.6	172.6	178.5	184.5
4.....	7.934	222.1	230.1	238.0	246.0
5.....	9.917	277.7	287.6	297.5	307.4
6.....	11.90	333.2	345.1	357.0	368.9
7.....	13.88	388.8	402.6	416.5	430.4
8.....	15.87	444.3	460.2	476.0	491.9
9.....	17.85	499.8	517.7	535.5	553.4

NOTE.—For partial month multiply values for one day by the number of days.

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1 second-foot equals 40 California miner's inches (law of Mar. 23, 1901).
1 second-foot equals 38.4 Colorado miner's inches.
1 second-foot equals 40 Arizona miner's inches.
1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.
1 second-foot for one year covers 1 square mile 1.131 feet or 13.572 inches deep.
1 second-foot for one year equals 31,536,000 cubic feet.
1 second-foot equals about 1 acre-inch per hour.
1 second-foot for one day equals 86,400 cubic feet.
1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for one day.
1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.
1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.
1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.
1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.
100 California miner's inches equals 18.7 United States gallons per second.
100 California miner's inches for one day equals 4.96 acre-feet.
100 Colorado miner's inches equals 2.60 second-feet.
100 Colorado miner's inches equals 19.5 United States gallons per second.
100 Colorado miner's inches for one day equals 5.17 acre-feet.
100 United States gallons per minute equals 0.223 second-feet.
100 United States gallons per minute for one day equals 0.442 acre-foot.
1,000,000 United States gallons per day equals 1.55 second-feet.
1,000,000 United States gallons equals 3.07 acre-feet.
1,000,000 cubic feet equals 22.95 acre-feet.
1 acre-foot equals 325,850 gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals 5,280 feet.
1 acre equals 0.4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.
1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76.0 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.
1⅓ horsepower equals about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Sec.-ft.} \times \text{fall in feet}}{11}$ = net horsepower on water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF DATA.

For each regular current-meter gaging station the following data are given: Description of the station, list of discharge measurements, table of daily gage heights, table of daily discharges, table of monthly and yearly discharges and run-off. For stations located at weirs or dams the gage-height table is omitted.

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In addition to statements regarding the location and installation of current-meter stations, the descriptions give information in regard to any conditions which may affect the constancy of the relation of gage height to discharge, covering such points as ice, logging, shifting channels, and backwater; also information regarding diversions which decrease the total flow at the measuring section. Statements are also made regarding the accuracy and reliability of the data.

The table of daily gage-heights records the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day, usually in the morning and in the evening. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. All gage heights affected by the presence of ice in the streams or by backwater from obstructions are published as recorded, with suitable footnotes. The rating table is not applicable for such periods unless the proper corrections to the gage heights are known and applied. Attention is called to the fact that the zero of the gage is placed at an arbitrary datum and has no relation to zero flow or the bottom of the river. In general, the zero is located somewhat below the lowest known flow, so that negative readings shall not occur.

The discharge measurements and gage heights are the base data from which rating tables, daily discharge tables, and monthly discharge tables are computed.

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is not published in this report, but can be determined from the tables of daily gage heights and daily discharge, as follows:

First plot the discharge measurements for the current and earlier years on cross-section paper, with gage heights in feet as ordinates and discharge in second-feet as abscissas. Then tabulate a number of gage heights taken from the daily gage-height table for the complete range of stage given and the corresponding discharges for the days selected from the daily discharge table and plot the values on cross-section paper. The last points plotted will define the rating curve used and will lie among the plotted discharge measurements. After drawing the rating curve, a table can be developed by scaling off the discharge in second-feet for each tenth foot of gage height. These values should be so adjusted that the first differences shall always be increasing or constant, except for known backwater periods.

The table of daily discharges gives the discharges in second-feet corresponding to the observed gage heights as determined from the rating tables.

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In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the stage when the water surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise in the column at "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this the computations for the remaining columns, which are defined on page 13, are based.

The field methods used in the collection of the data presented in this series of reports are described in the introductory sections of Water-Supply Papers 261 to 272, inclusive, "Surface water supply of the United States, 1909." Plate III shows typical gaging stations, indicating the method of suspending the current meter; Plate IV shows current meters [1] used in the work.

ACCURACY AND RELIABILITY OF FIELD DATA AND COMPARATIVE RESULTS.

The accuracy of stream-flow data depends primarily on the natural conditions at the gaging station and on the methods and care with which the data are collected. Errors of the first group depend on the degree of permanency of channel and of permanency of the relation between discharge and stage.

Errors of the second class are due, first, to errors in observation of stage; second, to errors in measurements of flow; and, third, to errors due to misinterpretation of stage and flow data.

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the daily discharge tables, stating the probable accuracy of the rating tables used, and an accuracy column is inserted in the monthly discharge table. For the rating tables "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate" within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The accuracy column in the monthly discharge table does not apply to the maximum or minimum nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating, the probable reliability of the observer, and knowledge of local conditions.

[1] See Hoyt, J. C., and others, Use and care of current meter as practiced by the United States Geological Survey: Trans. Am. Soc. Civil Eng., vol. 66, 1910, p. 70.

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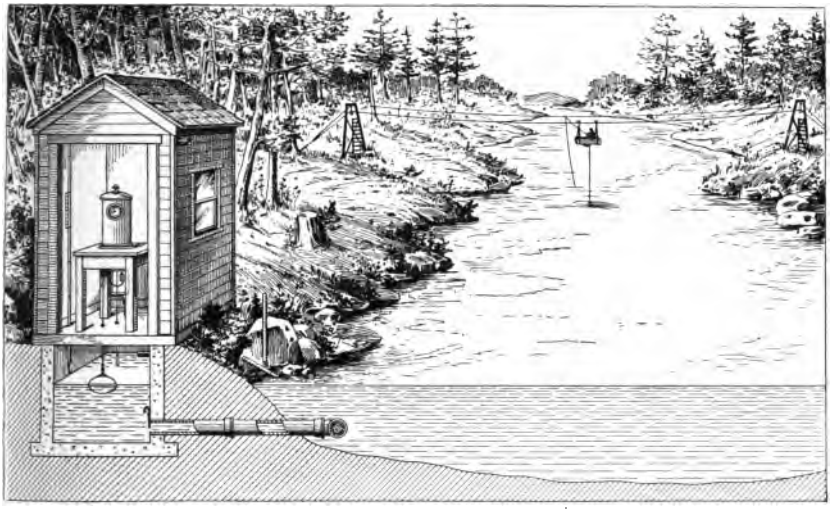

A. CABLE STATION WITH AUTOMATIC GAGE.

B. FOR BRIDGE MEASUREMENT.

TYPICAL GAGING STATIONS.

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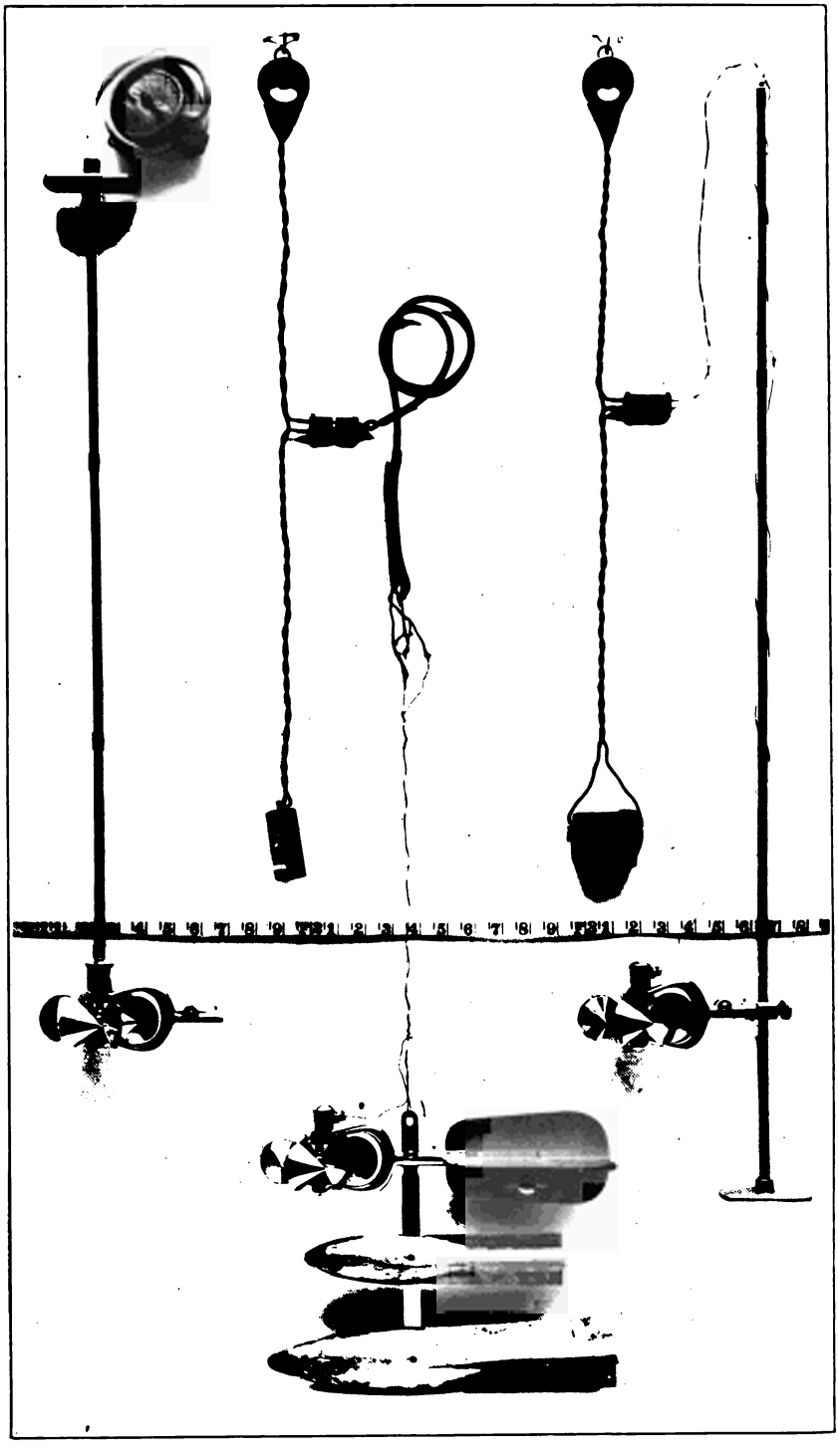

SMALL PRICE CURRENT METERS.

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In this column, A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

Even though the monthly means for any station may represent with a high degree of accuracy the quantity of water flowing past the gage, the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors which result from including in the measured drainage area large noncontributing districts or omitting estimates of water diverted for irrigation or other use, and they should, therefore, be considered as only approximate, particularly for periods of irrigation or of low water. For these errors it is as a rule not feasible to make adequate correction.

In general, the base data collected each year by the Survey engineers are published, not only to comply with the law, but also to afford any engineer the means of examining and adjusting to his own needs the results of the computations. The table of monthly discharge is so arranged as to give only a general idea of the flow at the station and should not be used for other than preliminary estimates. The determinations of daily discharge allow more detailed studies of the variation in flow by which the period of deficiency may be determined.

It should be borne in mind that the observations in each succeeding year may be expected to throw new light on data already collected and published, and the engineer who makes use of the figures presented in these papers should verify all ratings and make such adjustments for earlier years as may seem necessary.

COOPERATION AND ACKNOWLEDGMENTS.

The hydrographic work of the United States Geological Survey in California is being carried on in cooperation with the State in accordance with acts of the State legislature, approved March 16, 1903, March 20, 1905, March 11, 1907, and April 22, 1909.

The act of March 16, 1903, which covered the period from July 1, 1903, to June 30, 1905, is in substance as follows:

The State board of examiners are hereby empowered to enter into contracts with the Director of the United States Geological Survey for the purpose of making topographic maps to the extent of twenty thousand dollars; also for the purpose of gaging streams, surveying reservoir sites and canal locations, for the conservation and utilization of the flood and storm waters of the State, to the extent of fifteen thousand dollars * * *.

The acts of March 20, 1905, and March 11, 1907, are in substance the same as the previous acts, the appropriations being increased to $30,000 for topography and $20,000 for hydrography and covering

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the four fiscal years July 1, 1905, to June 30, 1909. The act of April 22, 1909, appropriates $30,000 per annum for cooperation between the State and Federal Government for topography, hydrography, and use and distribution of water for agricultural purposes, this appropriation being made continuous.

The Conservation Commission and the State Board of Control (water powers) of the State of California, in September, 1911, arranged for cooperation with the Water Resources Branch of the United States Geological Survey. This agreement provides for:

First, a complete digest of all available data concerning the flow of the streams in the State of California;

Second, records of streams not hitherto investigated;

Third, surveys of the streams, showing slope, topography, and such other data as may be necessary to determine water-power and storage possibilities along said streams.

The Conservation Commission appropriated $12,500 and the State Board of Control (water powers) $9,000 for this work. The reports containing these data will be published by the Geological Survey. The members of the conservation commission are: George C. Pardee, chairman; Francis Cuttle, and J. P. Baumgartner. The members of the State board of control (water powers) are: Hiram W. Johnson, governor; Charles D. Marx, chairman; S. C. Graham, Harold T. Power, and Nathaniel Ellery, State engineer. L. R. Glavis is secretary for both commissions.

Assistance has been rendered or records furnished by the following, to whom acknowledgment is due: Department of Engineering of the State of California, Nathaniel Ellery, State engineer; Hiram W. Johnson, governor; the United States Reclamation Service; the United States Forest Service, through W. L. Huber, district engineer; the United States Weather Bureau, through N. R. Taylor, local forecaster; the experimental stations, United States Department of Agriculture, through Frank Adams, irrigation manager; the United States Indian Service; the United States Fishery, through G. H. Lambson, superintendent; the Pacific Gas & Electric Co., through James H. Wise, assistant general manager; the Southern California Mountain Water Co., through M. M. O'Shaughnessy, chief engineer; the Ora Electric Co., through J. D. Galloway, consulting engineer; the Los Molinos Land Co., through Thomas H. Means, manager; the Volcan Land & Water Co., through W. S. Post, chief engineer; the Santa Barbara water commission, through Lee M. Hyde, engineer; the Turlock irrigation district, through Burton Smith, chief engineer; the Stone & Webster Engineering Corporation; Duryea, Haehl & Gilman; the Kern County Land Co., through G. K. Warren, engineer; and many other private parties. This cooperation is separately acknowledged in the station descriptions.

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DIVISION OF WORK.

The field work in California was carried on under the direction of W. B. Clapp and H. D. McGlashan, by J. E. Stewart, W. V. Hardy, F. C. Ebert, E. O. Christiansen, Lasley Lee, and Forest Service hydrographers—H. J. Tompkins, G. T. Peekema, and F. G. Wood.

The field work in the Klamath River basin in Oregon was carried on under the direction of W. W. Patch, project engineer, United States Reclamation Service, by J. C. Yadon and Leland Moser. The field data have been furnished by the United States Reclamation Service.

The ratings and special estimates were made by H. D. McGlashan, F. F. Henshaw, and R. H. Bolster. The computations were made and the completed data prepared for publication by R. C. Rice, E. S. Fuller, H. D. Padgett, H. J. Dean, A. H. Tuttle, and M. I. Walters.

The entire report was edited by Mrs. B. D. Wood.

SOUTHERN PACIFIC OCEAN DRAINAGE BASINS.

TIA JUANA RIVER BASIN.

COTTONWOOD CREEK NEAR JAMUL, CAL.

Location.—At the Barrett dam site, 6½ miles below intake of Dulzura conduit, in the SW. ¼ sec. 15, T. 17 S., R. 3 E., San Bernardino meridian, about 12 miles southeast of Jamul. Pine Valley Creek enters 1 mile and Lyons Creek one-half mile, respectively, above the station.

Records available.—December 15, 1905, to December 31, 1911.

Drainage area.—Approximately 270 square miles.

Gage.—Two vertical staffs are in use. Upper gage is on left bank near end of dam and indicates depth of water on the crest; lower gage, which is on upstream side of dam between flume and right bank, is read when no water is flowing over crest of dam; its datum is 2.50 feet lower than upper gage. The upper gage was not used during 1911.

Channel.—Shifting sand above dam.

Discharge measurements.—Made at low concrete dam, back of which sand and gravel have been deposited to the level of its crest. At low stages the flow is restricted to a rectangular wooden flume through the wall of the dam, but at high stages the flow is over the entire length of the dam, which is 61 feet. Measurements are made by wading except in high stages, when only float velocities can be obtained.

Diversions and storage.—Dulzura conduit diverts water from Cottonwood and Pine Valley creeks about half a mile above their junction. The Morena reservoir, about 9 miles above the Barrett dam site, has a capacity of 46,000 acre-feet. During 1911, 10,500 acre-feet were impounded at this reservoir.

Accuracy.—No discharge measurements were made during 1911. The range of stage was small and results are considered good.

Cooperation.—Daily discharge for 1911 furnished by the Southern California Mountain Water Co. through M. M. O'Shaughnessy, chief engineer. No daily gage heights were furnished, but daily discharge is stated to have been determined from the rating curve developed by the United States Geological Survey.

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Daily discharge, in second-feet, of Cottonwood Creek near Jamul, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	3.7	2.2	1.1	1.0	1.7	.....	.....	.....	.....	.....	0.1
2	3.4	2.6	2.2	1.5	1.1	1.7	.....	.....	.....	.....	.....	.1
3	3.4	3.7	3.7	1.4	1.0	1.7	.....	.....	.....	.....	.....	.1
4	2.6	2.8	13	1.4	1.1	1.4	.....	.....	.....	.....	.....	.1
5	2.6	35	7.2	1.4	1.0	1.3	.....	.....	.....	.....	.....	.6
6	2.6	3.7	2.4	1.4	1.0	1.2	.....	.....	.....	.....	.....	.6
7	2.0	3.7	2.0	1.5	1.0	.7	.....	.....	.....	.....	.....	.6
8	2.0	3.7	2.0	1.4	.8	.7	.....	.....	.....	.....	.....	.6
9	2.6	4.6	2.0	1.5	.8	.5	.....	.....	.....	.....	.....	.6
10	11	4.6	3.0	1.4	.8	.4	.....	.....	.....	.....	.....	.9
11	8.6	3.7	5.4	1.1	.8	.2	.....	.....	.....	.....	.....	.9
12	3.1	3.4	2.3	1.1	.8	.2	.....	.....	.....	.....	.....	.9
13	3.1	3.1	2.0	1.1	.8	.2	.....	.....	.....	.....	.....	.9
14	2.8	22	2.0	1.0	1.5	.2	.....	.....	.....	.....	.....	.9
15	3.1	5.9	1.5	1.0	1.0	.2	.....	.....	.....	.....	.....	.9
16	2.6	3.7	1.5	1.0	1.1	.2	.....	.....	.....	.....	.....	.9
17	2.5	3.6	1.4	1.0	.8	.2	.....	.....	.....	.....	.....	1.5
18	2.5	3.1	1.1	1.0	.8	.2	.....	.....	.....	.....	.....	1.5
19	2.3	2.3	1.1	1.0	.7	.2	.....	.....	.....	.....	.....	1.5
20	2.3	3.1	1.1	1.0	.7	.2	.....	.....	.....	.....	.....	1.5
21	2.3	2.5	1.4	1.1	1.3	.2	.....	.....	.....	.....	.....	1.5
22	2.3	2.0	1.4	1.0	1.3	.2	.....	.....	.....	.....	.....	1.5
23	2.3	2.0	1.4	1.1	1.3	.2	.....	.....	.....	.....	.....	1.5
24	2.3	2.0	1.1	1.0	1.0	.2	.....	.....	.....	.....	.....	1.5
25	2.3	1.9	1.1	1.1	.8	.2	.....	.....	.....	.....	.....	1.5
26	2.3	1.5	1.1	1.5	1.0	.2	.....	.....	.....	.....	.....	1.5
27	2.3	2.3	1.1	1.5	.7	.1	.....	.....	.....	.....	.....	1.5
28	2.3	2.6	1.1	1.5	1.3	.0	.....	.....	.....	.....	.....	1.5
29	2.6	.....	1.1	1.0	1.0	.0	.....	.....	.....	.....	.....	1.5
30	2.6	.....	1.1	1.0	1.0	.0	.....	.....	.....	.....	.....	1.5
31	3.7	.....	1.1	.....	1.0	.....	.....	.....	.....	.....	.....	1.5

NOTE.—Creek dry at gage June 28 to Nov. 30. Discharge determined from a fairly well defined rating curve. Table shows amount of water flowing in stream at Barrett dam site below intake of conduit.

Daily discharge, in second-feet, of Cottonwood Creek and Dulzura conduit near Jamul, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.
1	3.4	23	26	9.5	16	23.0	46	21	8.0
2	3.4	19	35	22	17	7.1	36	20	8.0
3	3.4	36	46	18	18	19.0	31	18	8.0
4	2.6	68	78	14	19	9.3	28	16	8.0
5	2.6	97	40	11	20	9.3	27	15	8.0
6	2.6	41	26	11	21	6.9	22	15	8.1
7	2.0	24	26	26	22	6.9	15	18	8.0
8	2.0	52	30	18	23	9.3	12	16	6.9
9	2.6	47	35	14	24	15	12	14	6.8
10	11.0	45	62	13	25	6.9	16	14	6.9
11	8.6	41	43	11	26	17	14	14	7.3
12	3.1	36	40	11	27	9.3	37	14	7.3
13	3.1	21	30	11	28	6.9	31	12	7.3
14	2.8	73	26	9.4	29	9.6	.....	12	6.8
15	7.7	54	22	9.4	30	16	.....	9.5	6.8
					31	14	.....	9.5	.....

NOTE.—Table shows the total flow past the station, including the diversion.
No record of discharge in the flume Jan. 1 to 14 and May to December. Probably a small amount of water in conduit during May. See table of discharge of Cottonwood Creek.

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Combined monthly discharge of Cottonwood Creek and Dulzura conduit near Jamul, Cal., for 1911.

Month.	Discharge in second-feet.					Run-off (total in acre-feet).		
	Maximum creek, plus conduit.	Minimum creek, plus conduit.	Mean.			Creek.	Conduit.	Creek, plus conduit.
			Creek.	Conduit.	Creek, plus conduit.			
January	23	2.0	3.09	4.81	7.95	190	296	489
February	97	12	4.96	31.0	35.9	275	1,720	1,990
March	78	9.5	2.33	23.6	25.9	143	1,450	1,590
April	26	6.8	1.20	9.45	10.7	71	562	637
May	1.5	.7	.98	a.00	.98	60	a0	60
June	1.7	.0	.49	.00	.49	29	0	29
July to November	.0	.0	.00	.00	.00	0	0	0
December	1.5	.1	1.04	.00	1.04	64	0	64
The year	97	.0	1.15	5.56	6.71	832	4,030	4,860

a See footnote to daily discharge of Dulzura Conduit.

NOTE.—About 10,500 acre-feet were impounded in the Morena reservoir during 1911; hence the total run-off from the Cottonwood drainage during this year was about 15,400 acre-feet.

DULZURA CONDUIT NEAR JAMUL, CAL.

Location.—About 12 miles below intake and 9 miles southeast of Jamul. During 1909 and 1910 station was located 1½ miles below intake.

Records available.—January 1, 1909, to December 31, 1911.

Gage.—Lietz water register at weir.

Discharge.—Computed from gage height record at an 8-foot steel plate weir about 1¼ miles above lower end of conduit.

Accuracy.—Automatic gage is checked twice each day by patrolman. Results are believed to be excellent.

Cooperation.—Daily discharge furnished by Southern California Mountain Water Co. through M. M. O'Shaughnessy, chief engineer.

The Dulzura conduit diverts water from Cottonwood and Pine Valley creeks, about half a mile above their junction, into Dulzura Creek drainage. From the end of the conduit the water flows down the natural channel of Dulzura Creek into the Lower Otay reservoir. The water is used for municipal purposes at San Diego. The conduit is 13.38 miles long and is concrete lined except 4,490 feet of flume and 9,219 feet of tunnel. The average width is about 5 feet and the depth 4 feet 2 inches. The grade is 4 feet in 5,000 and the capacity 40,000,000 gallons in 24 hours. The seepage loss between intake and measuring weir amounts to about 3 per cent.

Daily discharge, in second-feet, of Dulzura conduit near Jamul, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.
1	0.0	19.2	24.0	8.4	16	20.0	42.5	19.2	7.0
2	.0	16.3	32.7	20.0	17	4.6	32.7	18.6	7.0
3	.0	32.7	42.5	16.3	18	16.3	28.2	17.0	7.0
4	.0	65.1	65.1	13.0	19	7.0	26.0	14.5	7.0
5	.0	62.1	32.7	9.8	20	7.0	24.0	14.2	7.0
6	.0	37.4	24.0	9.8	21	4.6	20.0	13.5	7.0
7	.0	20.0	24.0	24.0	22	4.6	13.0	16.3	7.0
8	.0	47.9	28.2	16.3	23	7.0	9.8	14.5	5.8
9	.0	42.5	32.7	13.0	24	13.0	9.8	13.2	5.8
10	.0	40.5	59.2	11.4	25	4.6	14.2	13.2	5.8
11	.0	37.4	37.4	9.8	26	14.4	13.0	13.0	5.8
12	.0	32.7	37.4	9.8	27	7.0	35.1	12.4	5.8
13	.0	18.1	28.2	9.8	28	4.6	28.2	11.0	5.8
14	.0	50.7	24.0	8.4	29	7.0	.....	10.5	5.8
15	4.6	47.9	20.7	8.4	30	13.0	.....	8.4	5.8
					31	9.9	.....	8.4	.....

NOTE.—Little or no water in the flume Jan. 1 to 14 and June to December. Probably a small amount of water running during May.
For monthly discharge, see table above.

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SWEETWATER RIVER BASIN.

SWEETWATER RIVER NEAR DESCANSO, CAL.

Location.—At the Ellis ranch in the SE. ¼ sec. 25, T. 15 S., R. 3 E., San Bernardino meridian, 2 miles below mouth of Guatay Creek and about 1½ miles below Descanso.

Records available.—November 21, 1905, to December 31, 1911.

Drainage area.—40 square miles.

Gage.—Staff in three sections on left bank.

Channel.—Sand and gravel; shifting.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—A small irrigation ditch (capacity, about one-third second-foot) heads about 1,000 feet above the station.

Accuracy.—Results fair.

Discharge measurements of Sweetwater River near Descanso, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 9	W. V. Hardy	3.70	6.1
Mar. 8	do	4.12	24
Apr. 17	do	3.85	4.6
May 8	do	3.77	2.3
Nov. 9	F. C. Ebert	3.58	*a* .7

a Estimated.

NOTE.—Measurements made by wading at various sections in the vicinity of the gage.

Daily gage height, in feet, of Sweetwater River near Descanso, Cal., for 1911.

[Chas. H. Ellis, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.48	4.50	3.96	4.06	.....	3.64	3.51	3.54	3.52	3.54	3.58	3.60
2	3.48	4.15	3.98	4.14	.....	3.62	3.51	3.54	3.52	3.52	3.58	3.60
3	3.48	4.28	4.10	4.07	.....	3.62	3.51	3.53	3.52	3.52	3.58	3.60
4	3.47	4.85	4.85	4.04	.....	3.61	3.51	3.52	3.52	3.53	3.58	3.60
5	3.47	4.85	4.48	4.02	.....	3.61	3.51	3.52	3.52	3.53	3.58	3.60
6	3.47	4.85	4.12	4.02	.....	3.60	3.52	3.52	3.52	3.54	3.58	3.65
7	3.46	4.85	4.08	4.10	.....	3.60	3.52	3.52	3.52	3.54	3.58	3.69
8	3.47	3.72	4.08	4.05	.....	3.60	3.52	3.52	3.52	3.54	3.58	3.65
9	3.48	3.70	4.08	3.96	3.71	3.60	3.53	3.52	3.52	3.54	3.58	3.64
10	4.15	3.70	4.38	3.92	3.71	3.60	3.54	3.52	3.52	3.54	3.58	3.62
11	4.88	3.85	4.29	3.92	3.71	3.59	3.54	3.52	3.50	3.54	3.58	3.62
12	3.77	3.95	4.25	3.91	3.71	3.59	3.54	3.52	3.50	3.54	3.59	3.62
13	3.71	3.98	4.18	3.89	3.71	3.58	3.54	3.52	3.50	3.54	3.60	3.62
14	3.70	4.28	4.02	3.88	3.71	3.57	3.54	3.52	3.50	3.54	3.60	3.62
15	3.74	4.08	3.98	3.88	3.71	3.55	3.54	3.52	3.50	3.54	3.60	3.62
16	3.71	3.86	3.98	3.88	3.71	3.54	3.54	3.52	3.50	3.54	3.60	3.62
17	3.64	3.91	3.98	3.86	3.71	3.54	3.54	3.52	3.50	3.54	3.60	3.68
18	3.61	3.89	3.98	3.86	3.71	3.53	3.54	3.52	3.50	3.54	3.60	3.66
19	3.59	3.86	3.97	3.86	3.71	3.52	3.54	3.51	3.50	3.54	3.60	3.64
20	3.56	3.82	3.98	3.86	3.64	3.51	3.54	3.51	3.50	3.54	3.60	3.64
21	3.54	3.80	4.00	3.86	3.64	3.51	3.54	3.51	3.50	3.54	3.60	3.64
22	3.51	3.79	4.06	3.86	3.62	3.51	3.54	3.51	3.52	3.54	3.60	3.64
23	3.50	3.77	4.06	3.84	3.64	3.51	3.54	3.51	3.52	3.54	3.60	3.64
24	3.48	3.78	4.00	3.82	3.65	3.51	3.54	3.51	3.52	3.54	3.60	3.64
25	3.67	3.85	3.99	3.82	3.66	3.51	3.54	3.51	3.52	3.54	3.60	3.68
26	3.62	3.95	3.99	3.85	3.68	3.51	3.54	3.51	3.52	3.54	3.60	3.66
27	3.58	3.95	3.98	3.87	3.69	3.51	3.60	3.51	3.52	3.62	3.60	3.65
28	3.60	3.15	3.97	3.86	3.69	3.51	3.60	3.51	3.52	3.60	3.60	3.70
29	3.59	.....	3.97	3.86	3.68	3.51	3.54	3.51	3.53	3.60	3.60	3.78
30	3.58	.....	3.96	3.85	3.67	3.51	3.54	3.51	3.56	3.60	3.60	3.71
31	3.58	.....	3.94	.....	3.66	.....	3.54	3.51	.....	3.58	.....	3.68

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Daily discharge, in second-feet, of Sweetwater River near Descanso, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.3	107	16	18	4.2	1.1	0.4	0.6	0.5	0.6	0.7	0.8
2	.3	50	17	26	3.8	.9	.4	.6	.5	.5	.7	.8
3	.3	69	26	19	3.4	.9	.4	.5	.5	.5	.7	.8
4	.2	182	146	17	3.1	.9	.4	.5	.5	.5	.7	.8
5	.2	182	76	14	2.8	.9	.4	.5	.5	.5	.7	.8
6	.2	182	28	14	2.5	.8	.5	.5	.5	.6	.7	1.2
7	.2	182	23	22	2.2	.8	.5	.5	.5	.6	.7	1.4
8	.2	8.0	20	17	1.9	.8	.5	.5	.5	.6	.7	1.2
9	.3	6.0	20	10	1.6	.8	.5	.5	.5	.6	.7	1.1
10	31	6.0	55	7.7	1.6	.8	.6	.5	.5	.6	.7	.9
11	168	16	43	7.7	1.6	.8	.6	.5	.4	.6	.7	.9
12	5	26	38	7.1	1.6	.8	.6	.5	.4	.6	.8	.9
13	3.7	29	30	6.1	1.6	.7	.6	.5	.4	.6	.8	.9
14	3.0	68	14	5.7	1.6	.7	.6	.5	.4	.6	.8	.9
15	4.0	41	11	5.7	1.6	.6	.6	.5	.4	.6	.8	.9
16	3.7	14	11	5.7	1.6	.6	.6	.5	.4	.6	.8	.9
17	2.0	18	11	5.0	1.6	.6	.6	.5	.4	.6	.8	1.4
18	1.8	16	11	5.0	1.6	.5	.6	.5	.4	.6	.8	1.2
19	1.6	14	11	5.0	1.6	.5	.6	.4	.4	.6	.8	1.1
20	1.4	11	11	5.0	1.1	.4	.6	.4	.4	.6	.8	1.1
21	1.4	8.0	13	5.0	1.1	.4	.6	.4	.4	.6	.8	1.1
22	1.2	7.0	18	5.0	.9	.4	.6	.4	.5	.6	.8	1.1
23	1.2	6.0	18	4.2	1.1	.4	.6	.4	.5	.6	.8	1.1
24	1.0	7.0	13	3.5	1.2	.4	.6	.4	.5	.6	.8	1.1
25	4.0	10	12	3.5	1.2	.4	.6	.4	.5	.6	.8	1.4
26	2.6	15	12	4.6	1.4	.4	.6	.4	.5	.6	.8	1.2
27	2.0	15	11	5.4	1.4	.4	.8	.4	.5	.9	.8	1.2
28	2.4	.0	11	5.0	1.4	.4	.8	.4	.5	.8	.8	1.5
29	2.2	.....	11	5.0	1.4	.4	.6	.4	.5	.8	.8	2.5
30	2.0	.....	10	4.6	1.3	.4	.6	.4	.6	.8	.8	1.6
31	2.2	.....	8.9	.....	1.2	.....	.6	.4	.....	.7	.....	1.4

NOTE.—Daily discharge determined by the indirect method for shifting channels Jan. 1 to Mar. 7, and a fairly well defined rating curve Mar. 8 to Dec. 31.

Monthly discharge of Sweetwater River near Descanso, Cal., for 1911.

[Drainage area, 40 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	168	0.2	8.05	0.201	0.23	495	C.
February	182	.0	46.2	1.16	1.21	2,570	C.
March	146	8.9	24.4	.610	.70	1,500	C.
April	26	3.5	8.95	.224	.25	533	C.
May	4.2	.9	1.81	.045	.05	111	C.
June	1.1	.4	.63	.016	.02	37.5	C.
July	.8	.4	.57	.014	.02	35.0	C.
August	.6	.4	.46	.012	.01	28.3	C.
September	.6	.4	.47	.012	.01	28.0	C.
October	.9	.5	.62	.016	.02	38.1	C.
November	.8	.7	.76	.019	.02	45.2	C.
December	2.5	.8	1.14	.028	.03	70.1	C.
The year	182	.0	7.58	.190	2.57	5,490	

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SAN DIEGO RIVER BASIN.

SAN DIEGO RIVER AT LAKESIDE, CAL.

Location.—On the Elcajon grant, just above ford on Lakeside-Padre Barona Valley road, three-fourths mile above the Cuyamaca & Eastern Railroad bridge, and three-fourths mile north of Lakeside.

Records available.—December 3, 1905, to December 31, 1911.

Drainage area.—208 square miles.

Gage.—Staff in three sections on left bank 100 feet above ford.

Channel.—Shifting sand.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—San Diego flume heads at diverting dam about 1,000 feet below Boulder Creek and about 15 miles above the station. Five pumping plants, 1 to 3 miles above the station, obtain water for irrigation from wells along the banks of the stream. The capacity of these plants ranges from about 0.5 to 2.5 second-feet. Cuyamaca reservoir, on the headwaters of Boulder Creek, has a capacity of 11,410 acre-feet.

Accuracy.—Results are fair.

Discharge measurements of San Diego River at Lakeside, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 10	W. V. Hardy	2.92	18
Mar. 9	do	3.47	108
10	do	3.95	272
11	do	3.60	176
Apr. 18[a]	do	3.10	12
May 9[b]	do	3.03	.7
Oct. 9[c]	F. C. Ebert	.....	.0

[a] Made by wading 150 feet above gage. [b] Made by wading 125 feet above gage. [c] River dry.

Daily gage height, in feet, of San Diego River at Lakeside, Cal., for 1911.

[J. H. Beadle, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	.....	2.79	3.35	3.10	3.10	3.0
2	.....	2.82	3.25	3.40	3.10	3.0
3	.....	2.91	3.20	3.25	3.05	3.0
4	.....	4.15	3.84	3.20	3.04	3.0
5	.....	3.80	3.60	3.18	3.00	3.0
6	.....	3.32	3.46	3.18	3.00	3.0
7	.....	3.23	3.37	3.30	3.00	3.0
8	.....	3.05	3.50	3.40	3.00	3.0
9	.....	3.00	3.50	3.30	3.00	3.0
10	.....	2.92	3.68	3.25	3.02	3.0
11	.....	2.90	3.60	3.20	3.00	3.0
12	.....	2.91	3.50	3.15	3.00	3.0
13	.....	3.05	3.42	3.12	3.00	3.0
14	.....	3.70	3.33	3.12	3.00	3.0
15	.....	3.33	3.32	3.12	3.00	3.0
16	.....	3.29	3.30	3.12	3.04	3.0
17	.....	3.18	3.27	3.10	3.02	3.0
18	.....	3.15	3.25	3.10	3.0	3.0
19	.....	3.10	3.23	3.09	3.0	3.0
20	.....	3.09	3.20	3.08	3.0	3.0
21	.....	3.05	3.20	3.08	3.0	3.0
22	.....	3.01	3.20	3.10	3.0	3.0
23	.....	3.02	3.20	3.10	3.0	3.0
24	.....	3.03	3.19	3.08	3.0	3.0
25	.....	3.07	3.18	3.08	3.0	3.0

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Daily gage height, in feet, of San Diego River at Lakeside, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
26	3.00	3.15	3.15	3.06	3.0	3.0
27	2.95	3.12	3.11	3.10	3.0	3.0
28	2.90	3.23	3.12	3.11	3.0	3.0
29	2.90	.....	3.10	3.10	3.0	3.0
30	2.88	.....	3.09	3.10	3.0	3.0
31	2.90	.....	3.10	.....	3.0	.....

NOTE.—River dry Jan. 1 to 25 and July to December. During the latter half of May and June the river derived its supply from a spring above the gage.

Daily discharge, in second-feet, of San Diego River at Lakeside, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.0	2	84	17	9	0.2
2	.0	4	56	88	9	.2
3	.0	16	38	44	3	.2
4	.0	655	290	33	2	.2
5	.0	375	167	29	.3	.2
6	.0	123	113	29	.3	.2
7	.0	93	80	57	.3	.2
8	.0	43	120	83	.3	.2
9	.0	32	117	55	.3	.2
10	.0	18	140	43	.5	.2
11	.0	14	176	32	.2	.2
12	.0	16	133	22	.2	.2
13	.0	37	105	16	.2	.2
14	.0	295	75	16	.2	.2
15	.0	116	72	16	.2	.2
16	.0	97	67	16	1.2	.2
17	.0	65	58	12	.4	.2
18	.0	50	52	12	.2	.2
19	.0	40	46	10	.2	.2
20	.0	37	40	8	.2	.2
21	.0	23	40	8	.2	.2
22	.0	18	40	11	.2	.2
23	.0	20	40	11	.2	.2
24	.0	18	35	7	.2	.2
25	.0	24	32	7	.2	.2
26	32	37	27	5	.2	.2
27	22	30	20	10	.2	.2
28	14	56	21	11	.2	.2
29	14	.....	17	10	.2	.2
30	12	.....	15	9	.2	.2
31	14	.....	17	.....	.2	.....

NOTE.—Daily discharge January 26, to May 10 determined by indirect method for shifting channels; discharge May 11 to June 30 estimated.

Monthly discharge of San Diego River at Lakeside, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	32	0	3.5	215	D.
February	655	2	84.1	4,670	C.
March	290	15	75.3	4,630	C.
April	88	5	24.2	1,440	D.
May	9	.2	.98	60.3	D.
June	.2	.2	.20	11.9	D.
July	.0	.0	.0	.0	
August	.0	.0	.0	.0	
September	.0	.0	.0	.0	
October	.0	.0	.0	.0	
November	.0	.0	.0	.0	
December	.0	.0	.0	.0	
The year	655	.0	15.2	11,000	

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the four fiscal years July 1, 1905, to June 30, 1909. The act of April 22, 1909, appropriates $30,000 per annum for cooperation between the State and Federal Government for topography, hydrography, and use and distribution of water for agricultural purposes, this appropriation being made continuous.

The Conservation Commission and the State Board of Control (water powers) of the State of California, in September, 1911, arranged for cooperation with the Water Resources Branch of the United States Geological Survey. This agreement provides for:

First, a complete digest of all available data concerning the flow of the streams in the State of California;

Second, records of streams not hitherto investigated;

Third, surveys of the streams, showing slope, topography, and such other data as may be necessary to determine water-power and storage possibilities along said streams.

The Conservation Commission appropriated $12,500 and the State Board of Control (water powers) $9,000 for this work. The reports containing these data will be published by the Geological Survey. The members of the conservation commission are: George C. Pardee, chairman; Francis Cuttle, and J. P. Baumgartner. The members of the State board of control (water powers) are: Hiram W. Johnson, governor; Charles D. Marx, chairman; S. C. Graham, Harold T. Power, and Nathaniel Ellery, State engineer. L. R. Glavis is secretary for both commissions.

Assistance has been rendered or records furnished by the following, to whom acknowledgment is due: Department of Engineering of the State of California, Nathaniel Ellery, State engineer; Hiram W. Johnson, governor; the United States Reclamation Service; the United States Forest Service, through W. L. Huber, district engineer; the United States Weather Bureau, through N. R. Taylor, local forecaster; the experimental stations, United States Department of Agriculture, through Frank Adams, irrigation manager; the United States Indian Service; the United States Fishery, through G. H. Lambson, superintendent; the Pacific Gas & Electric Co., through James H. Wise, assistant general manager; the Southern California Mountain Water Co., through M. M. O'Shaughnessy, chief engineer; the Ora Electric Co., through J. D. Galloway, consulting engineer; the Los Molinos Land Co., through Thomas H. Means, manager; the Volcan Land & Water Co., through W. S. Post, chief engineer; the Santa Barbara water commission, through Lee M. Hyde, engineer; the Turlock irrigation district, through Burton Smith, chief engineer; the Stone & Webster Engineering Corporation; Duryea, Haehl & Gilman; the Kern County Land Co., through G. K. Warren, engineer; and many other private parties. This cooperation is separately acknowledged in the station descriptions.

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DIVISION OF WORK.

The field work in California was carried on under the direction of W. B. Clapp and H. D. McGlashan, by J. E. Stewart, W. V. Hardy, F. C. Ebert, E. O. Christiansen, Lasley Lee, and Forest Service hydrographers—H. J. Tompkins, G. T. Peekema, and F. G. Wood.

The field work in the Klamath River basin in Oregon was carried on under the direction of W. W. Patch, project engineer, United States Reclamation Service, by J. C. Yadon and Leland Moser. The field data have been furnished by the United States Reclamation Service.

The ratings and special estimates were made by H. D. McGlashan, F. F. Henshaw, and R. H. Bolster. The computations were made and the completed data prepared for publication by R. C. Rice, E. S. Fuller, H. D. Padgett, H. J. Dean, A. H. Tuttle, and M. I. Walters.

The entire report was edited by Mrs. B. D. Wood.

SOUTHERN PACIFIC OCEAN DRAINAGE BASINS.

TIA JUANA RIVER BASIN.

COTTONWOOD CREEK NEAR JAMUL, CAL.

Location.—At the Barrett dam site, 6½ miles below intake of Dulzura conduit, in the SW. ¼ sec. 15, T. 17 S., R. 3 E., San Bernardino meridian, about 12 miles southeast of Jamul. Pine Valley Creek enters 1 mile and Lyons Creek one-half mile, respectively, above the station.

Records available.—December 15, 1905, to December 31, 1911.

Drainage area.—Approximately 270 square miles.

Gage.—Two vertical staffs are in use. Upper gage is on left bank near end of dam and indicates depth of water on the crest; lower gage, which is on upstream side of dam between flume and right bank, is read when no water is flowing over crest of dam; its datum is 2.50 feet lower than upper gage. The upper gage was not used during 1911.

Channel.—Shifting sand above dam.

Discharge measurements.—Made at low concrete dam, back of which sand and gravel have been deposited to the level of its crest. At low stages the flow is restricted to a rectangular wooden flume through the wall of the dam, but at high stages the flow is over the entire length of the dam, which is 61 feet. Measurements are made by wading except in high stages, when only float velocities can be obtained.

Diversions and storage.—Dulzura conduit diverts water from Cottonwood and Pine Valley creeks about half a mile above their junction. The Morena reservoir, about 9 miles above the Barrett dam site, has a capacity of 46,000 acre-feet. During 1911, 10,500 acre-feet were impounded at this reservoir.

Accuracy.—No discharge measurements were made during 1911. The range of stage was small and results are considered good.

Cooperation.—Daily discharge for 1911 furnished by the Southern California Mountain Water Co. through M. M. O'Shaughnessy, chief engineer. No daily gage heights were furnished, but daily discharge is stated to have been determined from the rating curve developed by the United States Geological Survey.

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Daily discharge, in second-feet, of Cottonwood Creek near Jamul, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.4	3.7	2.2	1.1	1.0	1.7	.....	.....	.....	.....	.....	0.1
2	3.4	2.6	2.2	1.5	1.1	1.7	.....	.....	.....	.....	.....	.1
3	3.4	3.7	3.7	1.4	1.0	1.7	.....	.....	.....	.....	.....	.1
4	2.6	2.8	13	1.4	1.1	1.4	.....	.....	.....	.....	.....	.1
5	2.6	35	7.2	1.4	1.0	1.3	.....	.....	.....	.....	.....	.6
6	2.6	3.7	2.4	1.4	1.0	1.2	.....	.....	.....	.....	.....	.6
7	2.0	3.7	2.0	1.5	1.0	.7	.....	.....	.....	.....	.....	.6
8	2.0	3.7	2.0	1.4	.8	.7	.....	.....	.....	.....	.....	.6
9	2.6	4.6	2.0	1.5	.8	.5	.....	.....	.....	.....	.....	.6
10	11	4.6	3.0	1.4	.8	.4	.....	.....	.....	.....	.....	.9
11	8.6	3.7	5.4	1.1	.8	.2	.....	.....	.....	.....	.....	.9
12	3.1	3.4	2.3	1.1	.8	.2	.....	.....	.....	.....	.....	.9
13	3.1	3.1	2.0	1.1	.8	.2	.....	.....	.....	.....	.....	.9
14	2.8	22	2.0	1.0	1.5	.2	.....	.....	.....	.....	.....	.9
15	3.1	5.9	1.5	1.0	1.0	.2	.....	.....	.....	.....	.....	.9
16	2.6	3.7	1.5	1.0	1.1	.2	.....	.....	.....	.....	.....	.9
17	2.5	3.6	1.4	1.0	.8	.2	.....	.....	.....	.....	.....	1.5
18	2.5	3.1	1.1	1.0	.8	.2	.....	.....	.....	.....	.....	1.5
19	2.3	2.3	1.1	1.0	.7	.2	.....	.....	.....	.....	.....	1.5
20	2.3	3.1	1.1	1.0	.7	.2	.....	.....	.....	.....	.....	1.5
21	2.3	2.5	1.4	1.1	1.3	.2	.....	.....	.....	.....	.....	1.5
22	2.3	2.0	1.4	1.0	1.3	.2	.....	.....	.....	.....	.....	1.5
23	2.3	2.0	1.4	1.1	1.3	.2	.....	.....	.....	.....	.....	1.5
24	2.3	2.0	1.1	1.0	1.0	.2	.....	.....	.....	.....	.....	1.5
25	2.3	1.9	1.1	1.1	.8	.2	.....	.....	.....	.....	.....	1.5
26	2.3	1.5	1.1	1.5	1.0	.2	.....	.....	.....	.....	.....	1.5
27	2.3	2.3	1.1	1.5	.7	.1	.....	.....	.....	.....	.....	1.5
28	2.3	2.6	1.1	1.5	1.3	.0	.....	.....	.....	.....	.....	1.5
29	2.6	.....	1.1	1.0	1.0	.0	.....	.....	.....	.....	.....	1.5
30	2.6	.....	1.1	1.0	1.0	.0	.....	.....	.....	.....	.....	1.5
31	3.7	.....	1.1	.....	1.0	.....	.....	.....	.....	.....	.....	1.5

NOTE.—Creek dry at gage June 28 to Nov. 30. Discharge determined from a fairly well defined rating curve. Table shows amount of water flowing in stream at Barrett dam site below intake of conduit.

Daily discharge, in second-feet, of Cottonwood Creek and Dulzura conduit near Jamul, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.
1	3.4	23	26	9.5	16	23.0	46	21	8.0
2	3.4	19	35	22	17	7.1	36	20	8.0
3	3.4	36	46	18	18	19.0	31	18	8.0
4	2.6	68	78	14	19	9.3	28	16	8.0
5	2.6	97	40	11	20	9.3	27	15	8.0
6	2.6	41	26	11	21	6.9	22	15	8.1
7	2.0	24	26	26	22	6.9	15	18	8.0
8	2.0	52	30	18	23	9.3	12	16	6.9
9	2.6	47	35	14	24	15	12	14	6.8
10	11.0	45	62	13	25	6.9	16	14	6.9
11	8.6	41	43	11	26	17	14	14	7.3
12	3.1	36	40	11	27	9.3	37	14	7.3
13	3.1	21	30	11	28	6.9	31	12	7.3
14	2.8	73	26	9.4	29	9.6	.....	12	6.8
15	7.7	54	22	9.4	30	16	.....	9.5	6.8
					31	14	.....	9.5	.....

NOTE.—Table shows the total flow past the station, including the diversion.
No record of discharge in the flume Jan. 1 to 14 and May to December. Probably a small amount of water in conduit during May. See table of discharge of Cottonwood Creek.

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Combined monthly discharge of Cottonwood Creek and Dulzura conduit near Jamul, Cal., for 1911.

Month.	Discharge in second-feet.					Run-off (total in acre-feet).		
	Maximum creek, plus conduit.	Minimum creek, plus conduit.	Mean.			Creek.	Conduit.	Creek, plus conduit.
			Creek.	Conduit.	Creek, plus conduit.			
January	23	2.0	3.09	4.81	7.95	190	296	489
February	97	12	4.96	31.0	35.9	275	1,720	1,990
March	78	9.5	2.33	23.6	25.9	143	1,450	1,590
April	26	6.8	1.20	9.45	10.7	71	562	637
May	1.5	.7	.98	[a].00	.98	60	[a]0	60
June	1.7	.0	.49	.00	.49	29	0	29
July to November	.0	.0	.00	.00	.00	0	0	0
December	1.5	.1	1.04	.00	1.04	64	0	64
The year	97	.0	1.15	5.56	6.71	832	4,030	4,860

[a] See footnote to daily discharge of Dulzura Conduit.

NOTE.—About 10,500 acre-feet were impounded in the Morena reservoir during 1911; hence the total run-off from the Cottonwood drainage during this year was about 15,400 acre-feet.

DULZURA CONDUIT NEAR JAMUL, CAL.

Location.—About 12 miles below intake and 9 miles southeast of Jamul. During 1909 and 1910 station was located 1½ miles below intake.

Records available.—January 1, 1909, to December 31, 1911.

Gage.—Lietz water register at weir.

Discharge.—Computed from gage height record at an 8-foot steel plate weir about 1¼ miles above lower end of conduit.

Accuracy.—Automatic gage is checked twice each day by patrolman. Results are believed to be excellent.

Cooperation.—Daily discharge furnished by Southern California Mountain Water Co. through M. M. O'Shaughnessy, chief engineer.

The Dulzura conduit diverts water from Cottonwood and Pine Valley creeks, about half a mile above their junction, into Dulzura Creek drainage. From the end of the conduit the water flows down the natural channel of Dulzura Creek into the Lower Otay reservoir. The water is used for municipal purposes at San Diego. The conduit is 13.38 miles long and is concrete lined except 4,490 feet of flume and 9,219 feet of tunnel. The average width is about 5 feet and the depth 4 feet 2 inches. The grade is 4 feet in 5,000 and the capacity 40,000,000 gallons in 24 hours. The seepage loss between intake and measuring weir amounts to about 3 per cent.

Daily discharge, in second-feet, of Dulzura conduit near Jamul, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.
1	0.0	19.2	24.0	8.4	16	20.0	42.5	19.2	7.0
2	.0	16.3	32.7	20.0	17	4.6	32.7	18.6	7.0
3	.0	32.7	42.5	16.3	18	16.3	28.2	17.0	7.0
4	.0	65.1	65.1	13.0	19	7.0	26.0	14.5	7.0
5	.0	62.1	32.7	9.8	20	7.0	24.0	14.2	7.0
6	.0	37.4	24.0	9.8	21	4.6	20.0	13.5	7.0
7	.0	20.0	24.0	24.0	22	4.6	13.0	16.3	7.0
8	.0	47.9	28.2	16.3	23	7.0	9.8	14.5	5.8
9	.0	42.5	32.7	13.0	24	13.0	9.8	13.2	5.8
10	.0	40.5	59.2	11.4	25	4.6	14.2	13.2	5.8
11	.0	37.4	37.4	9.8	26	14.4	13.0	13.0	5.8
12	.0	32.7	37.4	9.8	27	7.0	35.1	12.4	5.8
13	.0	18.1	28.2	9.8	28	4.6	28.2	11.0	5.8
14	.0	50.7	24.0	8.4	29	7.0	.....	10.5	5.8
15	4.6	47.9	20.7	8.4	30	13.0	.....	8.4	5.8
					31	9.9	.....	8.4	.....

NOTE.—Little or no water in the flume Jan. 1 to 14 and June to December. Probably a small amount of water running during May.
For monthly discharge, see table above.

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SWEETWATER RIVER BASIN.

SWEETWATER RIVER NEAR DESCANSO, CAL.

Location.—At the Ellis ranch in the SE. ¼ sec. 25, T. 15 S., R. 3 E., San Bernardino meridian, 2 miles below mouth of Guatay Creek and about 1½ miles below Descanso.

Records available.—November 21, 1905, to December 31, 1911.

Drainage area.—40 square miles.

Gage.—Staff in three sections on left bank.

Channel.—Sand and gravel; shifting.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—A small irrigation ditch (capacity, about one-third second-foot) heads about 1,000 feet above the station.

Accuracy.—Results fair.

Discharge measurements of Sweetwater River near Descanso, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 9	W. V. Hardy	3.70	6.1
Mar. 8	do	4.12	24
Apr. 17	do	3.85	4.6
May 8	do	3.77	2.3
Nov. 9	F. C. Ebert	3.58	*a* .7

a Estimated.

NOTE.—Measurements made by wading at various sections in the vicinity of the gage.

Daily gage height, in feet, of Sweetwater River near Descanso, Cal., for 1911.

[Chas. H. Ellis, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.48	4.50	3.96	4.06	.....	3.64	3.51	3.54	3.52	3.54	3.58	3.60
2	3.48	4.15	3.98	4.14	.....	3.62	3.51	3.54	3.52	3.52	3.58	3.60
3	3.48	4.28	4.10	4.07	.....	3.62	3.51	3.53	3.52	3.52	3.58	3.60
4	3.47	4.85	4.85	4.04	.....	3.61	3.51	3.52	3.52	3.53	3.58	3.60
5	3.47	4.85	4.48	4.02	.....	3.61	3.51	3.52	3.52	3.53	3.58	3.60
6	3.47	4.85	4.12	4.02	.....	3.60	3.52	3.52	3.52	3.54	3.58	3.65
7	3.46	4.85	4.08	4.10	.....	3.60	3.52	3.52	3.52	3.54	3.58	3.69
8	3.47	3.72	4.08	4.05	.....	3.60	3.52	3.52	3.52	3.54	3.58	3.65
9	3.48	3.70	4.08	3.96	3.71	3.60	3.53	3.52	3.52	3.54	3.58	3.64
10	4.15	3.70	4.38	3.92	3.71	3.60	3.54	3.52	3.52	3.54	3.58	3.62
11	4.88	3.85	4.29	3.92	3.71	3.59	3.54	3.52	3.50	3.54	3.58	3.62
12	3.77	3.95	4.25	3.91	3.71	3.59	3.54	3.52	3.50	3.54	3.59	3.62
13	3.71	3.98	4.18	3.89	3.71	3.58	3.54	3.52	3.50	3.54	3.60	3.62
14	3.70	4.28	4.02	3.88	3.71	3.57	3.54	3.52	3.50	3.54	3.60	3.62
15	3.74	4.08	3.98	3.88	3.71	3.55	3.54	3.52	3.50	3.54	3.60	3.62
16	3.71	3.86	3.98	3.88	3.71	3.54	3.54	3.52	3.50	3.54	3.60	3.62
17	3.64	3.91	3.98	3.86	3.71	3.54	3.54	3.52	3.50	3.54	3.60	3.68
18	3.61	3.89	3.98	3.86	3.71	3.53	3.54	3.52	3.50	3.54	3.60	3.66
19	3.59	3.86	3.97	3.86	3.71	3.52	3.54	3.51	3.50	3.54	3.60	3.64
20	3.56	3.82	3.98	3.86	3.64	3.51	3.54	3.51	3.50	3.54	3.60	3.64
21	3.54	3.80	4.00	3.86	3.64	3.51	3.54	3.51	3.50	3.54	3.60	3.64
22	3.51	3.79	4.06	3.86	3.62	3.51	3.54	3.51	3.52	3.54	3.60	3.64
23	3.50	3.77	4.06	3.84	3.64	3.51	3.54	3.51	3.52	3.54	3.60	3.64
24	3.48	3.78	4.00	3.82	3.65	3.51	3.54	3.51	3.52	3.54	3.60	3.64
25	3.67	3.85	3.99	3.82	3.66	3.51	3.54	3.51	3.52	3.54	3.60	3.68
26	3.62	3.95	3.99	3.85	3.68	3.51	3.54	3.51	3.52	3.54	3.60	3.66
27	3.58	3.95	3.98	3.87	3.69	3.51	3.60	3.51	3.52	3.62	3.60	3.65
28	3.60	3.15	3.97	3.86	3.69	3.51	3.60	3.51	3.52	3.60	3.60	3.70
29	3.59	.....	3.97	3.86	3.68	3.51	3.54	3.51	3.53	3.60	3.60	3.78
30	3.58	.....	3.96	3.85	3.67	3.51	3.54	3.51	3.56	3.60	3.60	3.71
31	3.58	.....	3.94	.....	3.66	.....	3.54	3.51	.....	3.58	.....	3.68

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Daily discharge, in second-feet, of Sweetwater River near Descanso, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.3	107	16	18	4.2	1.1	0.4	0.6	0.5	0.6	0.7	0.8
2	.3	50	17	26	3.8	.9	.4	.6	.5	.5	.7	.8
3	.3	69	26	19	3.4	.9	.4	.5	.5	.5	.7	.8
4	.2	182	146	17	3.1	.9	.4	.5	.5	.5	.7	.8
5	.2	182	76	14	2.8	.9	.4	.5	.5	.5	.7	.8
6	.2	182	28	14	2.5	.8	.5	.5	.5	.6	.7	1.2
7	.2	182	23	22	2.2	.8	.5	.5	.5	.6	.7	1.4
8	.2	8.0	20	17	1.9	.8	.5	.5	.5	.6	.7	1.2
9	.3	6.0	20	10	1.6	.8	.5	.5	.5	.6	.7	1.1
10	31	6.0	55	7.7	1.6	.8	.6	.5	.5	.6	.7	.9
11	168	16	43	7.7	1.6	.8	.6	.5	.4	.6	.7	.9
12	5	26	38	7.1	1.6	.8	.6	.5	.4	.6	.8	.9
13	3.7	29	30	6.1	1.6	.7	.6	.5	.4	.6	.8	.9
14	3.0	68	14	5.7	1.6	.7	.6	.5	.4	.6	.8	.9
15	4.0	41	11	5.7	1.6	.6	.6	.5	.4	.6	.8	.9
16	3.7	14	11	5.7	1.6	.6	.6	.5	.4	.6	.8	.9
17	2.0	18	11	5.0	1.6	.6	.6	.5	.4	.6	.8	1.4
18	1.8	16	11	5.0	1.6	.5	.6	.5	.4	.6	.8	1.2
19	1.6	14	11	5.0	1.6	.5	.6	.4	.4	.6	.8	1.1
20	1.4	11	11	5.0	1.1	.4	.6	.4	.4	.6	.8	1.1
21	1.4	8.0	13	5.0	1.1	.4	.6	.4	.4	.6	.8	1.1
22	1.2	7.0	18	5.0	.9	.4	.6	.4	.5	.6	.8	1.1
23	1.2	6.0	18	4.2	1.1	.4	.6	.4	.5	.6	.8	1.1
24	1.0	7.0	13	3.5	1.2	.4	.6	.4	.5	.6	.8	1.1
25	4.0	10	12	3.5	1.2	.4	.6	.4	.5	.6	.8	1.4
26	2.6	15	12	4.6	1.4	.4	.6	.4	.5	.6	.8	1.2
27	2.0	15	11	5.4	1.4	.4	.8	.4	.5	.9	.8	1.2
28	2.4	.0	11	5.0	1.4	.4	.8	.4	.5	.8	.8	1.5
29	2.2	.....	11	5.0	1.4	.4	.6	.4	.5	.8	.8	2.5
30	2.0	.....	10	4.6	1.3	.4	.6	.4	.6	.8	.8	1.6
31	2.2	.....	8.9	.....	1.2	.....	.6	.4	.....	.7	.....	1.4

NOTE.—Daily discharge determined by the indirect method for shifting channels Jan. 1 to Mar. 7, and a fairly well defined rating curve Mar. 8 to Dec. 31.

Monthly discharge of Sweetwater River near Descanso, Cal., for 1911.

[Drainage area, 40 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	168	0.2	8.05	0.201	0.23	495	C.
February	182	.0	46.2	1.16	1.21	2,570	C.
March	146	8.9	24.4	.610	.70	1,500	C.
April	26	3.5	8.95	.224	.25	533	C.
May	4.2	.9	1.81	.045	.05	111	C.
June	1.1	.4	.63	.016	.02	37.5	C.
July	.8	.4	.57	.014	.02	35.0	C.
August	.6	.4	.46	.012	.01	28.3	C.
September	.6	.4	.47	.012	.01	28.0	C.
October	.9	.5	.62	.016	.02	38.1	C.
November	.8	.7	.76	.019	.02	45.2	C.
December	2.5	.8	1.14	.028	.03	70.1	C.
The year	182	.0	7.58	.190	2.57	5,490	

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SAN DIEGO RIVER BASIN.

SAN DIEGO RIVER AT LAKESIDE, CAL.

Location.—On the Elcajon grant, just above ford on Lakeside-Padre Barona Valley road, three-fourths mile above the Cuyamaca & Eastern Railroad bridge, and three-fourths mile north of Lakeside.

Records available.—December 3, 1905, to December 31, 1911.

Drainage area.—208 square miles.

Gage.—Staff in three sections on left bank 100 feet above ford.

Channel.—Shifting sand.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—San Diego flume heads at diverting dam about 1,000 feet below Boulder Creek and about 15 miles above the station. Five pumping plants, 1 to 3 miles above the station, obtain water for irrigation from wells along the banks of the stream. The capacity of these plants ranges from about 0.5 to 2.5 second-feet. Cuyamaca reservoir, on the headwaters of Boulder Creek, has a capacity of 11,410 acre-feet.

Accuracy.—Results are fair.

Discharge measurements of San Diego River at Lakeside, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 10	W. V. Hardy	2.92	18
Mar. 9	do	3.47	108
10	do	3.95	272
11	do	3.60	176
Apr. 18[a]	do	3.10	12
May 9[b]	do	3.03	.7
Oct. 9[c]	F. C. Ebert	.....	.0

[a] Made by wading 150 feet above gage. [b] Made by wading 125 feet above gage. [c] River dry.

Daily gage height, in feet, of San Diego River at Lakeside, Cal., for 1911.

[J. H. Beadle, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	.....	2.79	3.35	3.10	3.10	3.0
2	.....	2.82	3.25	3.40	3.10	3.0
3	.....	2.91	3.20	3.25	3.05	3.0
4	.....	4.15	3.84	3.20	3.04	3.0
5	.....	3.80	3.60	3.18	3.00	3.0
6	.....	3.32	3.46	3.18	3.00	3.0
7	.....	3.23	3.37	3.30	3.00	3.0
8	.....	3.05	3.50	3.40	3.00	3.0
9	.....	3.00	3.50	3.30	3.00	3.0
10	.....	2.92	3.68	3.25	3.02	3.0
11	.....	2.90	3.60	3.20	3.00	3.0
12	.....	2.91	3.50	3.15	3.00	3.0
13	.....	3.05	3.42	3.12	3.00	3.0
14	.....	3.70	3.33	3.12	3.00	3.0
15	.....	3.33	3.32	3.12	3.00	3.0
16	.....	3.29	3.30	3.12	3.04	3.0
17	.....	3.18	3.27	3.10	3.02	3.0
18	.....	3.15	3.25	3.10	3.0	3.0
19	.....	3.10	3.23	3.09	3.0	3.0
20	.....	3.09	3.20	3.08	3.0	3.0
21	.....	3.05	3.20	3.08	3.0	3.0
22	.....	3.01	3.20	3.10	3.0	3.0
23	.....	3.02	3.20	3.10	3.0	3.0
24	.....	3.03	3.19	3.08	3.0	3.0
25	.....	3.07	3.18	3.08	3.0	3.0

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Daily gage height, in feet, of San Diego River at Lakeside, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
26	3.00	3.15	3.15	3.06	3.0	3.0
27	2.95	3.12	3.11	3.10	3.0	3.0
28	2.90	3.23	3.12	3.11	3.0	3.0
29	2.90	.....	3.10	3.10	3.0	3.0
30	2.88	.....	3.09	3.10	3.0	3.0
31	2.90	.....	3.10	.....	3.0	.....

NOTE.—River dry Jan. 1 to 25 and July to December. During the latter half of May and June the river derived its supply from a spring above the gage.

Daily discharge, in second-feet, of San Diego River at Lakeside, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.0	2	84	17	9	0.2
2	.0	4	56	88	9	.2
3	.0	16	38	44	3	.2
4	.0	655	290	33	2	.2
5	.0	375	167	29	.3	.2
6	.0	123	113	29	.3	.2
7	.0	93	80	57	.3	.2
8	.0	43	120	83	.3	.2
9	.0	32	117	55	.3	.2
10	.0	18	140	43	.5	.2
11	.0	14	176	32	.2	.2
12	.0	16	133	22	.2	.2
13	.0	37	105	16	.2	.2
14	.0	295	75	16	.2	.2
15	.0	116	72	16	.2	.2
16	.0	97	67	16	1.2	.2
17	.0	65	58	12	.4	.2
18	.0	50	52	12	.2	.2
19	.0	40	46	10	.2	.2
20	.0	37	40	8	.2	.2
21	.0	23	40	8	.2	.2
22	.0	18	40	11	.2	.2
23	.0	20	40	11	.2	.2
24	.0	18	35	7	.2	.2
25	.0	24	32	7	.2	.2
26	32	37	27	5	.2	.2
27	22	30	20	10	.2	.2
28	14	56	21	11	.2	.2
29	14	.....	17	10	.2	.2
30	12	.....	15	9	.2	.2
31	14	.....	17	.....	.2	.....

NOTE.—Daily discharge January 26, to May 10 determined by indirect method for shifting channels; discharge May 11 to June 30 estimated.

Monthly discharge of San Diego River at Lakeside, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	32	0	3.5	215	D.
February	655	2	84.1	4,670	C.
March	290	15	75.3	4,630	C.
April	88	5	24.2	1,440	D.
May	9	.2	.98	60.3	D.
June	.2	.2	.20	11.9	D.
July	.0	.0	.0	.0	
August	.0	.0	.0	.0	
September	.0	.0	.0	.0	
October	.0	.0	.0	.0	
November	.0	.0	.0	.0	
December	.0	.0	.0	.0	
The year	655	.0	15.2	11,000	

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Combined daily discharge, in second-feet, of San Diego River and flume at Lakeside, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	13	87	27	20	6.4	0.0	7.8	6.4	0.0	0.0	0.0
2	2.7	15	64	96	20	5.8	.0	8.3	6.7	.0	.0	.0
3	2.5	26	41	56	15	3.4	.9	7.8	6.4	.0	.0	.0
4	4.6	660	292	36	12	8.2	7.1	7.1	6.4	.1	.0	.0
5	5.2	380	170	41	12	8.2	7.6	7.4	6.4	.0	.0	.0
6	5.4	134	116	40	9.8	5.6	8.0	7.1	6.0	.1	.0	.0
7	5.6	106	82	67	11	3.6	7.1	7.4	5.6	.0	.0	.0
8	5.6	56	122	93	11	3.0	1.0	2.4	5.4	.0	.0	.0
9	6.4	45	121	67	9.8	2.9	.0	.0	3.2	2.2	.0	.0
10	6.4	31	144	54	9.2	1.4	.0	.0	2.5	.0	.0	.0
11	6.2	26	180	44	8.7	2.9	.0	.0	1.0	.0	.0	.0
12	8.3	26	136	34	8.7	1.2	.0	.0	2.1	.0	.0	.0
13	8.7	47	107	16	8.0	1.5	.0	.9	2.2	.0	.0	.0
14	7.8	306	76	16	7.8	4.1	7.4	6.7	2.7	.0	.0	.0
15	7.0	127	73	29	8.7	5.8	8.5	7.4	3.4	.0	.0	.0
16	9.5	108	72	29	9.7	6.6	7.4	7.8	3.9	.0	.0	.0
17	9.5	74	67	26	8.2	7.8	5.0	8.5	3.9	.0	.0	.0
18	8.7	61	60	27	7.3	7.6	4.8	9.0	3.5	.0	.0	.0
19	6.9	51	53	25	7.1	1.2	4.6	8.5	3.2	.0	.0	.0
20	5.4	48	47	24	5.8	.2	5.8	7.6	2.5	.0	.0	.0
21	4.4	34	47	20	4.6	.2	7.6	5.6	1.3	.0	.0	.0
22	3.9	29	48	23	2.7	.2	8.5	3.0	1.5	.0	.0	.0
23	3.2	30	47	26	4.6	3.0	1.7	1.2	2.0	.0	.0	.0
24	4.2	28	40	22	8.2	7.6	.0	1.3	2.4	.0	.0	.0
25	6.7	32	39	20	8.7	7.8	.0	1.8	.0	.0	.0	.0
26	40	38	34	18	9.2	8.2	.0	3.2	.3	.0	.0	.0
27	32	31	28	23	9.7	8.5	.0	6.7	.1	.0	.0	.0
28	22	59	30	19	9.7	2.0	.0	7.1	.0	.0	.0	.0
29	24	.....	27	21	7.8	.2	1.0	6.9	.3	.0	.0	.7
30	22	.....	26	20	6.0	.2	6.2	5.8	.1	.0	.0	3.0
31	24	.....	28	.....	6.2	.....	7.4	6.7	.....	.0	.....	.4

Combined monthly discharge of San Diego River and flume at Lakeside, Cal., for 1911.

[Drainage area, 208 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	40	2.5	10.1	0.049	0.06	621	C.
February	660	13	93.6	.450	.47	5,200	C.
March	292	26	80.8	.388	.45	4,970	C.
April	96	16	35.3	.170	.19	2,100	C.
May	20	2.7	9.26	.045	.05	569	B.
June	8.5	.2	4.18	.020	.02	249	B.
July	8.5	.0	3.47	.017	.02	213	B.
August	9.0	.0	5.19	.025	.03	319	B.
September	6.7	.0	3.05	.015	.02	181	D.
October	2.2	.0	.08	.00038	.0004	5	D.
November	.0	.0	.00	.00000	.0000	0	
December	3.0	.0	.13	.00062	.0007	8	D.
The year	660	.0	19.9	.096	1.31	14,400	

SAN DIEGO FLUME NEAR LAKESIDE, CAL.

Location.—One-fourth mile above trestle crossing at Los Coches Creek, about 3 miles southeast of Lakeside.

Records available.—January 1, 1907, to December 31, 1911.

Gage.—Depth of water in flume is measured at reference point at patrolman's cabin.

Discharge measurements.—Made in flume at reference point.

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Storage and diversions.—The Cuyamaca dam, on the headwaters of Boulder Creek, was built in 1886. It was one of the first earth dams constructed in California for irrigation storage. In 1894 it was enlarged and is now 41½ feet high and 635 feet long. The capacity of this reservoir is 11,400 acre-feet. From Cuyamaca reservoir the water flows down the natural channel of Boulder Creek and San Diego River to the intake of the San Diego flume, a distance of 12½ miles.

Accuracy.—Rating curve is fairly well defined. On account of leakage and diversion for irrigation on the Capitan Grande Indian Reservation, the record does not show the total diversion. Results are good.

Cooperation.—Gage-height record furnished by the Cuyamaca Water Co.

The San Diego flume, which is over 30 miles in length, is 6 feet wide and 16 inches deep and has a capacity of about 16 second-feet. It discharges into La Mesa reservoir, about 8 miles northeast of San Diego. This system supplied the city of San Diego with water until 1906, when the Southern California Mountain Water Co. extended its system to the city. It now supplies water for irrigation for about 6,000 acres. There is considerable loss between intake and gaging station due to leakage in flume. Occasionally water from the South Fork of San Diego River is diverted into this flume. Water is diverted from the San Diego flume above the station for irrigation on the Capitan Grande Indian Reservation.

Discharge measurements of San Diego flume near Lakeside, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 10	V. V. Hardy	0.82	14
Oct. 9	F. C. Ebert	.....	0

Daily gage height, in feet, of San Diego flume near Lakeside, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.30	0.71	0.33	0.66	0.70	0.50	.....	0.57	0.51	.....	.....	.....
2	.31	.72	.58	.60	.72	.47	.....	.59	.52	.....	.....	.....
3	.30	.64	.34	.75	.73	.34	0.16	.57	.51	.....	.....	.....
4	.42	.42	.30	.30	.64	.58	.54	.54	.51	0.03	.....	.....
5	.45	.45	.35	.73	.72	.58	.56	.55	.51	.....	.....	.....
6	.46	.70	.30	.70	.64	.46	.58	.54	.49	.03	.....	.....
7	.47	.78	.27	.66	.70	.35	.54	.55	.47	.....	.....	.....
8	.47	.77	.27	.67	.68	.32	.17	.29	.46	.....	.....	.....
9	.51	.78	.40	.73	.64	.31	.....	.....	.34	.28	.....	.....
10	.51	.78	.41	.71	.61	.20	.....	.....	.30	.....	.....	.....
11	.50	.73	.41	.73	.60	.31	.....	.....	.18	.....	.....	.....
12	.59	.66	.33	.75	.60	.17	.....	.01	.27	.....	.....	.....
13	.61	.66	.30	.01	.57	.21	.....	.16	.28	.01	.....	.....
14	.57	.72	.22	.01	.56	.38	.55	.52	.31	.....	.....	.....
15	.56	.72	.17	.77	.60	.47	.60	.55	.35	.....	.....	.....
16	.64	.70	.46	.79	.60	.51	.55	.57	.38	.....	.....	.....
17	.64	.62	.62	.80	.57	.56	.44	.60	.38	.....	.....	.....
18	.61	.70	.57	.84	.54	.55	.43	.62	.36	.....	.....	.....
19	.53	.70	.55	.86	.53	.18	.42	.60	.34	.....	.....	.....
20	.46	.70	.55	.87	.47	.....	.48	.56	.30	.....	.....	.....
21	.41	.72	.54	.73	.41	.....	.56	.47	.21	.....	.....	.....
22	.38	.70	.58	.75	.30	.....	.60	.33	.22	.....	.....	.....
23	.34	.68	.53	.84	.41	.32	.24	.20	.26	.....	.....	.....
24	.40	.68	.43	.85	.58	.55	.....	.21	.29	.....	.....	.....
25	.52	.58	.52	.78	.60	.56	.....	.25	.....	.....	.....	.....
26	.58	.17	.54	.79	.62	.58	.....	.34	.07	.....	.....	.....
27	.67	.20	.56	.77	.64	.59	.....	.52	.03	.....	.....	.....
28	.60	.33	.61	.59	.64	.25	.....	.54	.....	.....	.....	.....
29	.64	.....	.67	.70	.56	.....	.17	.53	.08	.....	.....	0.14
30	.68	.....	.70	.70	.48	.....	.50	.48	.02	.....	.....	.33
31	.67	.....	.72	.....	.49	.....	.55	.52	.....	.....	.....	.10

NOTE.—No water flowing in flume on days of no gage reading.

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Daily discharge, in second-feet, of San Diego flume near Lakeside, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	11.2	3.0	9.9	10.9	6.2	0.0	7.8	6.4	0.0	0.0	0.0
2	2.7	11.4	8.0	8.5	11 4	5.6	.0	8.3	6.7	.0	.0	.0
3	2.5	9.5	3.2	12.2	11.7	3.2	.9	7.8	6.4	.0	.0	.0
4	4.6	4.6	2.5	2.5	9.5	8.0	7.1	7.1	6.4	.1	.0	.0
5	5.2	5.2	3.4	11.7	11.4	8.0	7.6	7.4	6.4	.0	.0	.0
6	5.4	10.9	2.5	10.9	9.5	5.4	8.0	7.1	6.0	.1	.0	.0
7	5.6	13.1	2.1	9.9	10.9	3.4	7.1	7.4	5.6	.0	.0	.0
8	5.6	12.8	2.1	10.2	10.4	2.8	1.0	2.4	5.4	.0	.0	.0
9	6.4	13.1	4.2	11.7	9.5	2.7	.0	.0	3.2	2.2	.0	.0
10	6.4	13.1	4.4	11.2	8.7	1.2	.0	.0	2.5	.0	.0	.0
11	6.2	11.7	4.4	11.7	8.5	2.7	.0	.0	1.0	.0	.0	.0
12	8.3	9.9	3.0	12.2	8.5	1.0	.0	.0	2.1	.0	.0	.0
13	8.7	9.9	2.5	.0	7.8	1.3	.0	.9	2.2	.0	.0	.0
14	7.8	11.4	1.5	.0	7.6	3.9	7.4	6.7	2.7	.0	.0	.0
15	7.6	11.4	1.0	12.8	8.5	5.6	8.5	7.4	3.4	.0	.0	.0
16	9.5	10.9	5.4	13.3	8.5	6.4	7.4	7.8	3.9	.0	.0	.0
17	9.5	9.0	9.0	13.6	7.8	7.6	5.0	8.5	3.9	.0	.0	.0
18	8.7	10.9	7.8	14.8	7.1	7.4	4.8	9.0	3.5	.0	.0	.0
19	6.9	10.9	7.4	15.3	6.9	1.0	4.6	8.5	3.2	.0	.0	.0
20	5.4	10.9	7.4	15.6	5.6	.0	5.8	7.6	2.5	.0	.0	.0
21	4.4	11.4	7.1	11.7	4.4	.0	7.6	5.6	1.3	.0	.0	.0
22	3.9	10.9	8.0	12.2	2.5	.0	8.5	3.0	1.5	.0	.0	.0
23	3.2	10.4	6.9	14.8	4.4	2.8	1.7	1.2	2.0	.0	.0	.0
24	4.2	10.4	4.8	15.0	8.0	7.4	.0	1.3	2.4	.0	.0	.0
25	6.7	8.0	6.7	13.1	8.5	7.6	.0	1.8	.0	.0	.0	.0
26	8.0	1.0	7.1	13.3	9.0	8.0	.0	3.2	.3	.0	.0	.0
27	10.2	1.2	7.6	12.8	9.5	8.3	.0	6.7	.1	.0	.0	.0
28	8.5	3.0	8.7	8.3	9.5	1.8	.0	7.1	.0	.0	.0	.0
29	9.5	.....	10.2	10.9	7.6	.0	1.0	6.9	.3	.0	.0	.7
30	10.4	.....	10.9	10.9	5.8	.0	6.2	5.8	.1	.0	.0	3.0
31	10.2	.....	11.4	.....	6.0	.....	7.4	6.7	.....	.0	.....	.4

NOTE.—Daily discharge determined from a well-defined rating curve.

Monthly discharge of San Diego flume near Lakeside, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	10.4	2.5	6.60	406	B.
February	13.1	1.0	9.58	532	A.
March	11.4	1.0	5.62	346	B.
April	15.6	.0	11.0	655	A.
May	11.7	2.5	8.25	507	A.
June	8.3	.0	3.98	237	B.
July	8.5	.0	3.47	213	B.
August	9.0	.0	5.19	319	B.
September	6.7	.0	3.05	181	D.
October	2.2	.0	.08	5	D.
November	.0	.0	.00	0	
December	3.0	.0	.13	8	D.
The year	15.6	.0	4.71	3,410	

SAN DIEGUITO RIVER BASIN.

SANTA YSABEL CREEK NEAR ESCONDIDO, CAL.

Location.—At the mouth of the canyon at the upper end of San Pasqual Valley, in the SW. ¼ sec. 31, T. 12 S., R. 1 E., San Bernardino meridian, and about 9 miles southeast of Escondido. Roden Canyon Creek enters 1½ miles above and Santa Maria Creek 4 miles below the station.

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Records available.—December 17, 1905, to December 31, 1911.
Drainage area.—128 square miles.
Gage.—Inclined staff on left bank.
Channel.—Shifting sand.
Discharge measurements.—Made from car and cable at gage, and by wading.
Accuracy.—No change in conditions of flow April to December, 1911. Results are good.
Cooperation.—Maintained in cooperation with Volcan Land & Water Co.

Discharge measurements of Santa Ysabel Creek near Escondido, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 7	W. V. Hardy	0.80	59
Mar. 5	do	.87	140
Apr. 11	do	.48	48
May 10	do	.25	17
June 26	do	.10	2.4
Oct. 15	F. C. Ebert	.06	*a*.2

a Estimated. Water sinks into the sand 100 feet below gage.

NOTE.—Measurements made by wading at various sections in the vicinity of the gage.

Daily gage height, in feet, of Santa Ysabel Creek near Escondido, Cal., for 1911.

[E. R. Harris, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		0.35	0.23	0.10					0.10
2		.30	.21	.10					.10
3		.31	.24	.09					.10
4		.32	25	.10					.11
5		.25	.20	.09					.11
6		.26	.20	.07					.17
7		.27	.18	.03					.20
8		.27	.19	.02					.18
9		.25	.15						.15
10		.26	.17						.11
11	0.48	.25	.19						.12
12	.50	.26	.19						.10
13	.47	.27	.16					0.08	.09
14	.40	.25	.15					.09	.09
15	.45	.28	.14				0.06	.10	.10
16	.39	.26	.17					.10	.11
17	.38	.22	.18					.11	.12
18	.40	.20	.15					.10	.12
19	.40	.25	.16					.09	.10
20	.39	.18	.16					.15	.10
21	.37	.19	.19					.15	.11
22	.40	.18	.20					.14	.20
23	.39	.20	.13					.12	.21
24	.39	.25	.14					.10	.19
25	.37	.23	.11					.10	.17
26	.37	.22	.12					.10	.15
27	.40	.20	.10					.09	.15
28	.40	.20	.11					.08	.16
29	.40	.22	.10					.05	.20
30	.37	.25	.10					.08	.21
31		.23							.19

NOTE.—Gage not read Jan. 1 to Apr. 10. Creek dry July 7 to about Oct. 14. Gage not read July 9 to Nov. 12, but observer's notes indicate that there was flow during first part of November and probably the latter half of October.

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Daily discharge, in second-feet, of Santa Ysabel Creek near Escondido, Cal., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		29	14	2.4					2.4
2		22	12	2.4					2.4
3		23	15	1.9					2.4
4		25	16	2.4					3.2
5		16	10	1.9					3.2
6		17	10	1.0					8.1
7		19	8.9	.0					10
8		19	9.7	.0					8.9
9		16	6.4	.0					6.4
10		16	8.1						3.2
11	49	16	9.7						4.0
12	52	17	9.7						2.4
13	47	19	7.3					1.4	1.9
14	36	16	6.4					1.9	1.9
15	44	20	5.6				0.2	2.4	2.4
16	35	17	8.1					2.4	3.2
7	33	13	8.9					3.2	4.0
18	36	10	6.4					2.4	4.0
19	36	16	7.3					1.9	2.4
20	35	8.9	7.3					6.4	2.4
21	32	9.7	9.7					6.4	3.2
22	36	8.9	10					5.6	10
23	35	10	4.8					4.0	12
24	35	16	5.6					2.4	9.7
25	32	14	3.2					2.4	8.1
26	32	13	4.0					2.4	6.4
27	36	10	2.4					1.9	6.4
28	36	10	3.2					1.4	7.3
29	36	13	2.4					.0	10
30	32	16	2.4					1.4	12
31		14							9.7

NOTE—Daily discharge determined from a well-defined rating curve.

Monthly discharge of Santa Ysabel Creek near Escondido, Cal., for 1911.

[Drainage area, 128 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
April 11-30	52	32	37.2	0.291	0.22	1,480	B.
May	29	8.9	15.8	.123	.14	972	B.
June	16	2.4	7.82	.061	.07	465	B.
July	2.4	.0	.39	.0030	.004	24	D.
August	.0	.0	.00	.0000	.000	.0	
September	.0	.0	.00	.0000	.000	.0	
October		.0	.032	.0003	.000	2.0	D.
November	6.4	.0	2.06	.016	.02	123	C.
December	12	1.9	5.60	.044	.05	344	B.
The period						3,410	

NOTE.—Daily discharge Oct. 16-31, estimated, 0.05 second-foot; Nov. 1-12, estimated, 1 second-foot.

SAN LUIS REY RIVER BASIN.

SAN LUIS REY RIVER NEAR MESA GRANDE, CAL.

Location.—At concrete weir in the NE. ¼ sec. 9, T. 11 S., R. 2 E., San Bernardino meridian, 1 mile below Warner dam site, and about 5 miles north of Mesa Grande.
Records available.—October 3 to December 31, 1911.

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Drainage area.—208 square miles.

Channel.—Sand and gravel and somewhat shifting. Weir acts as control for gage.

Discharge measurements.—Made from car and cable about 1 mile above gage and by wading.

Accuracy.—Frequent measurements are secured and results are good.

Cooperation.—Maintained in cooperation with Volcan Land & Water Co. through W. S. Post, engineer.

Discharge measurements of San Luis Rey River near Mesa Grande, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 11	F. C. Ebert	0.09	1.8
11	H. L. Davis	.09	1.7
Dec. 13	do	.11	2.2
20	do	.21	2.4
22	do	.12	2.6
22	do	.12	2.4
29	do	.50	20

NOTE.—All measurements made by wading below weir.

Daily gage height, in feet, and discharge, in second-feet, of San Luis Rey River near Mesa Grande, Cal., for 1911.

Day.	October.		November.		December.		Day.	October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	1.8	0.10	1.8	0.07	1.6	16	0.09	1.7	0.08	1.7	0.10	1.8
2	.....	1.8	.08	1.7	.06	1.6	17	.09	1.7	.08	1.7	.26	3.9
3	0.10	1.8	.08	1.7	.07	1.6	18	.09	1.7	.07	1.6	.26	3.9
4	.09	1.7	.07	1.6	.08	1.7	19	.10	1.8	.06	1.6	.23	3.2
5	.10	1.8	.07	1.6	.10	1.8	20	.10	1.8	.07	1.6	.21	2.8
6	.10	1.8	.06	1.6	.10	1.8	21	.09	1.7	.07	1.6	.24	3.4
7	.11	1.9	.09	1.7	.16	2.3	22	.10	1.8	.08	1.7	.12	2.0
8	.09	1.7	.09	1.7	.13	2.0	23	.12	2.0	.08	1.7	.13	2.0
9	.09	1.7	.10	1.8	.12	2.0	24	.12	2.0	.09	1.7	.16	2.3
10	.09	1.7	.09	1.7	.10	1.8	25	.12	2.0	.09	1.7	.13	2.0
11	.09	1.7	.09	1.7	.11	1.9	26	.13	2.0	.09	1.7	.10	1.8
12	.09	1.7	.07	1.6	.11	1.9	27	.18	2.4	.09	1.7	.10	1.8
13	.09	1.7	.08	1.7	.11	1.9	28	.16	2.3	.08	1.7	.20	2.6
14	.09	1.7	.10	1.8	.10	1.8	29	.09	1.7	.08	1.7	.45	15.00
15	.09	1.7	.09	1.7	.10	1.8	30	.09	1.7	.07	1.6	.29	4.5
							31	.09	1.7	.....	.....	.27	4.1

NOTE.—Daily discharge determined from a fairly well defined rating curve.

Monthly discharge of San Luis Rey River near Mesa Grande, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	2.4	1.7	1.81	111	C.
November	1.8	1.6	1.68	100	C.
December	15	1.6	2.73	168	C.

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SAN LUIS REY RIVER NEAR PALA, CAL.

Location.—At ford on road to Sickler's mill, in the NW. ¼ sec. 31, T. 9 S., R. 1 W., San Bernardino meridian, about 4 miles southeast of Pala.

Records available.—October 9, 1903 to June 30, 1911.

Drainage area.—318 square miles.

Gage.—Staff in two sections on left bank. The gage datum was lowered 4.66 feet on November 13, 1906.

Channel.—Sand, gravel, and bowlders; shifting.

Discharge measurements.—Made from car and cable 75 feet below gage and by wading.

Diversions and storage.—Water is diverted for irrigation on the Rincon Indian Reservation. The Escondido Mutual Water Co. diverts water from San Luis Rey River about 10 miles above the station. This water, which is stored at the Escondido reservoir, about 6 miles northeast of Escondido, is used for irrigation and municipal purposes at Escondido and vicinity. The capacity of the reservoir is 3,120 acre-feet. A small ditch diverts water from Pauma Creek for irrigation on the Pauma Indian Reservation. A small ditch 1 mile above the station supplies water for irrigation on the Sickler ranch.

Accuracy.—Results fair.

Cooperation.—Maintained in cooperation with Volcan Land & Water Co.

Discharge measurements of San Luis Rey River near Pala, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 5	W. V. Hardy	7.50	266
6	....do	7.20	200
Mar. 6	....do	7.20	161
Apr. 12[a]	....do	6.30	43
May 11[a]	....do	5.77	9.9
June 27[a]	....do	5.72	6.3
Oct. 14[a]	F. C. Ebert	5.70	5.8

[a] Made by wading at various sections in the vicinity of the gage.

Daily gage height, in feet, and discharge, in second-feet, of San Luis Rey River near Pala, Cal., for 1911.

[Louis Salmons, observer.]

Day.	January.		February.		March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	5	6.23	29	6.90	146	.....	80	5.96	18	5.81	10
2	.....	5	6.45	49	6.85	138	.....	300	5.90	15	5.82	11
3	.....	5	6.65	72	7.20	200	.....	150	5.88	14	5.79	9.6
4	.....	5	9.25	1,130	8.69	778	.....	100	5.91	16	5.80	10
5	.....	5	7.65	308	7.65	262	.....	90	5.88	14	5.80	10
6	.....	5	7.20	200	7.20	161	.....	90	5.88	14	5.79	9.6
7	.....	5	.....	140	.....	140	.....	170	5.88	14	5.73	7.2
8	.....	5	.....	100	.....	140	.....	280	5.87	14	5.73	7.2
9	.....	5	.....	75	.....	160	.....	160	5.86	13	5.70	6
10	7.20	158	.....	65	.....	350	.....	100	5.86	13	5.71	6.4
11	7.70	274	.....	60	8.80	805	.....	65	5.85	12	5.72	6.8
12	8.00	375	.....	70	.....	400	6.30	43	5.85	12	5.69	5.7
13	.....	150	.....	80	7.20	161	6.30	43	5.85	12	5.70	6
14	.....	30	7.25	210	.....	150	6.24	38	5.88	14	5.71	6.4
15	.....	45	.....	200	.....	140	6.21	35	5.87	14	5.68	5.4

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Daily gage height, in feet, and discharge, in second-feet, of San Luis Rey River near Pala, Cal., for 1911—Continued.

Day.	January.		February.		March.		April.		May.		June.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
16	.....	45	7.10	181	7.05	135	6.23	37	5.85	12	5.68	5.4
17	.....	30	.....	170	.....	130	6.21	35	5.85	12	5.66	4.8
18	.....	20	.....	160	.....	125	6.18	33	5.83	12	5.65	4.5
19	.....	10	.....	160	6.95	120	6.15	30	5.78	9.2	5.67	5.1
20	.....	10	.....	150	.....	115	6.15	30	5.71	6.4	5.68	5.4
21	.....	10	.....	140	.....	110	6.18	33	5.69	5.7	5.68	5.4
22	.....	10	.....	170	.....	110	6.19	33	5.72	6.8	5.70	6
23	.....	10	8.20	510	.....	105	6.17	32	5.75	8	5.68	5.4
24	.....	10	7.55	280	.....	105	6.13	29	5.75	8	5.70	6
25	.....	10	.....	170	.....	100	6.12	28	5.75	8	5.70	6
26	.....	140	.....	145	.....	95	6.80	98	5.76	8.4	5.70	6
27	.....	60	6.90	146	.....	90	6.60	74	5.76	8.4	5.70	6
28	.....	30	7.28	216	.....	90	6.50	63	5.74	7.6	5.72	6.8
29	.....	30	.....	.....	.....	85	6.01	21	5.77	8.8	5.71	6.4
30	.....	25	.....	.....	.....	85	5.99	20	5.78	9.2	5.70	6
31	.....	25	.....	.....	.....	80	.....	.....	5.81	10	.....	.....

NOTE.—Daily discharge determined from three fairly well-defined rating curves applicable Jan. 1 to Feb. 4, Feb. 5 to Mar. 4, and Mar. 5 to Dec. 31. Daily discharge for days on which gage was not read determined by means of hydrograph comparison with discharge of Santa Ana River near Mentone, San Diego River at Lakeside, and Sweetwater River at Descanso. These values are only very rough approximations.

Monthly discharge of San Luis Rey River near Pala, Cal., for 1911.

[Drainage area, 318 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	375	5	50.1	0.158	0.18	3,080	D.
February	1,130	29	192	.604	.63	10,700	C.
March	805	80	187	.588	.68	11,500	C.
April	300	20	78.0	.245	.27	4,640	C.
May	18	5.7	11.3	.036	.04	695	C.
June	11	4.5	6.75	.021	.02	402	C.
The period	.....	.....	.....	.....	.....	31,000	

SANTA ANA RIVER BASIN.

SANTA ANA RIVER NEAR MENTONE, CAL.

Location.—Just above road crossing opposite Warm Springs Canyon, in the SW. ¼ SW. ¼ sec. 34, T. 1 N., R. 2 W., San Bernardino meridian, three-fourths of a mile below intake of Pacific Light & Power Co.'s canal, about 2 miles above the mouth of the canyon, and 5 miles northeast of Mentone.

Records available.—July 1, 1896, to December 31, 1911.

Drainage area.—182 square miles.

Gage.—Vertical staff on right bank about 100 feet above ford. The present gage was installed February 25, 1910. Previous to this date various gages were used. The original datum has not been maintained.

Channel.—Gravel and bowlders; will shift during high water.

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Discharge measurements.—The flood of January, 1910, destroyed the car and cable. This equipment has not been replaced as it is difficult to reach the station at high water. Measurements are made by wading at medium and low stages.

Artificial control.—Southern California Edison Co.'s power plants Nos. 1 and 2 are located 5¼ and 2¾ miles, respectively, above the Mentone plant at the mouth of the canyon. The intake of the Pacific Light & Power Co.'s canal is at plant No. 2. The tail race from this plant discharges into the canal.

Diversions.—The Green Spot pipe line diverts water from the forebay at the Mentone power house. Water is stored on Bear Creek at Bear Valley reservoir.

Accuracy.—Results are good, except at extreme high stages.

Discharge measurements of Santa Ana River near Mentone, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 17	W. V. Hardy	2.28	104
21	do	2.01	76
Apr. 8	do	3.68	162
22	do	3.43	96
May 25	do	3.15	49
June 26	H. D. McGlashan	2.94	21
Aug. 29	F. C. Ebert	2.53	1.7

NOTE.—Measurements made by wading at various sections in the vicinity of the gage.

Daily gage height, in feet, of Santa Ana River near Mentone, Cal., for 1911.

[R. B. Richardson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.1	2.8	2.1	3.9	3.4	3.0	2.9	2.5	2.5	2.6	2.5	2.5
2	1.1	2.6	2.1	3.9	3.4	3.0	2.9	2.5	2.5	2.5	2.5	2.5
3	1.1	2.4	2.1	3.9	3.4	3.0	2.9	2.5	2.5	2.5	2.5	2.5
4	1.1	3.4	3.2	3.9	3.4	3.0	2.9	2.5	2.5	2.5	2.5	2.5
5	1.1	2.9	2.6	3.9	3.4	3.0	2.8	2.5	2.5	2.5	2.5	2.5
6	1.1	2.6	2.5	3.8	3.4	3.0	2.8	2.5	2.5	2.5	2.5	2.5
7	1.1	2.5	2.5	3.8	3.4	3.0	2.8	2.5	2.5	2.5	2.5	2.5
8	1.1	2.5	3.2	3.7	3.3	3.0	2.8	2.5	2.5	2.5	2.5	2.5
9	1.1	2.4	4.0	3.6	3.3	3.0	2.8	2.5	2.5	2.5	2.5	2.5
10	2.7	2.3	5.0	3.6	3.2	3.0	2.7	2.5	2.5	2.5	2.5	2.5
11	1.9	2.2	4.9	3.7	3.1	3.6	2.7	2.5	2.5	2.5	2.5	2.5
12	1.4	2.2	4.7	3.7	3.1	3.0	2.7	2.5	2.5	2.5	2.5	2.5
13	1.0	2.2	4.5	3.6	3.1	3.0	2.7	2.5	2.5	2.5	2.5	2.5
14	1.0	2.6	4.3	3.6	3.1	3.0	2.7	2.5	2.5	2.5	2.5	2.5
15	2.0	2.6	4.3	3.6	3.3	3.0	2.7	2.5	2.5	2.5	2.5	2.5
16	1.9	2.6	4.2	3.6	3.2	3.0	2.8	2.5	2.5	2.5	2.5	2.5
17	1.6	2.2	4.1	3.5	3.2	3.0	3.0	2.5	2.5	2.5	2.5	2.5
18	1.1	2.1	4.1	3.5	3.2	3.0	2.9	2.5	2.5	2.5	2.5	2.5
19	1.0	2.1	4.1	3.5	3.1	3.0	2.9	2.5	2.5	2.5	2.5	2.5
20	.9	2.1	4.0	3.4	3.1	3.0	2.8	2.5	2.5	2.5	2.5	2.5
21	.9	2.0	3.9	3.4	3.1	3.0	3.4	2.5	2.5	2.5	2.5	2.5
22	.9	2.0	3.9	3.4	3.1	3.0	3.4	2.5	2.5	2.5	2.5	2.5
23	.9	2.1	3.9	3.4	3.1	3.0	3.5	2.5	2.5	2.5	2.5	2.5
24	.9	2.1	3.9	3.4	3.1	3.0	3.5	2.5	2.5	2.5	2.5	2.5
25	2.3	2.0	3.9	3.4	3.1	3.0	3.5	2.5	2.5	2.5	2.5	2.5
26	2.4	2.0	3.9	3.4	3.1	2.9	3.5	2.5	2.5	2.5	2.5	2.5
27	1.6	2.1	3.9	3.4	3.1	2.9	3.0	2.5	2.5	2.5	2.5	2.5
28	1.2	2.1	3.9	3.4	3.1	2.9	2.8	2.5	2.5	2.5	2.5	2.5
29	4.5	.....	3.9	3.4	3.1	2.9	2.5	2.5	2.9	2.5	2.5	2.5
30	2.8	.....	3.9	3.4	3.1	2.9	2.5	2.5	2.9	2.5	2.5	2.5
31	2.6	.....	3.9	.....	3.0	.....	2.5	2.5	.....	2.5	.....	2.5

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Daily discharge, in second-feet, of Santa Ana River near Mentone, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3	193	86	240	89	29	19	1	1	3	1	1
2	3	158	86	240	89	29	19	1	1	1	1	1
3	3	127	86	240	89	29	19	1	1	1	1	1
4	3	360	290	240	89	20	19	1	1	1	1	1
5	3	213	158	240	89	29	12	1	1	1	1	1
6	3	158	142	202	89	29	12	1	1	1	1	1
7	3	142	142	202	89	29	12	1	1	1	1	1
8	3	142	290	168	71	29	12	1	1	1	1	1
9	3	127	690	137	71	29	12	1	1	1	1	1
10	175	113	1,840	137	55	29	7	1	1	1	1	1
11	62	99	1,400	168	41	137	7	1	1	1	1	1
12	16	99	900	168	41	29	7	1	1	1	1	1
13	1	99	570	137	41	29	7	1	1	1	1	1
14	1	158	435	137	41	29	7	1	1	1	1	1
15	74	158	435	137	71	29	7	1	1	1	1	1
16	62	158	375	137	55	29	12	1	1	1	1	1
17	32	99	325	111	55	29	29	1	1	1	1	1
18	3	86	325	111	55	29	19	1	1	1	1	1
19	1	86	325	111	41	29	19	1	1	1	1	1
20	0	86	280	89	41	29	12	1	1	1	1	1
21	0	74	240	89	41	29	89	1	1	1	1	1
22	0	74	240	89	41	29	89	1	1	1	1	1
23	0	86	240	89	41	29	111	1	1	1	1	1
24	0	86	240	89	41	29	111	1	1	1	1	1
25	113	74	240	89	41	29	111	1	1	1	1	1
26	127	74	240	89	41	19	111	1	1	1	1	1
27	32	86	240	89	41	19	29	1	1	1	1	1
28	6	86	240	89	41	19	12	1	1	1	1	1
29	1,160	.....	240	89	41	19	1	1	19	1	1	1
30	193	.....	240	89	41	19	1	1	19	1	1	1
31	158	.....	240	.....	29	.....	1	1	.....	1	.....	1

NOTE.—Daily discharge determined from two rating curves well defined below about 200 second-feet and applicable Jan. 1 to Mar. 10 and Mar. 13 to Dec. 31. Discharge Mar. 11 and Mar. 12 estimated.

Monthly discharge of Santa Ana River near Mentone, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	1,160	0	72.4	4,450	C.
February	360	74	125	6,940	A.
March	1,840	86	381	23,400	B.
April	240	89	141	8,390	A.
May	89	29	56.2	3,460	A.
June	137	19	30.9	1,840	B.
July	111	1	30.2	1,860	B.
August	1	1	1.0	62	D.
September	19	1	2.2	131	D.
October	3	1	1.1	68	D.
November	1	1	1.0	60	D.
December	1	1	1.0	62	D.
The year	1,840	0	70.1	50,700	

PACIFIC LIGHT & POWER CO.'S CANAL[1] AND GREENSPOT PIPE LINE NEAR MENTONE, CAL.

Location.—At tail race of Pacific Light & Power Co.'s plant at mouth of canyon, about 3 miles northeast of Mentone.

Records available.—1896 to December 31, 1911.

Gage.—Hook gage at weir about 300 feet west of power house.

[1] Formerly known as Mentone Power Co.'s canal.

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Discharge.—Computed from gage heights which give head on 10-foot rectangular weir.

Diversions.—The Greenspot pipe line diverts from the forebay. This water must be added to give total flow of canal. The pipe line was put in operation September 7 and discharges are recorded in miner's inches.

Accuracy.—Results are excellent.

Combined daily discharge, in second-feet, of Santa Ana River and Pacific Light & Power Co.'s canal, including Greenspot pipe line, near Mentone, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	44	261	158	313	159	103	96	65	61	79	52	45
2	45	230	158	313	160	103	95	71	66	63	50	47
3	43	198	158	313	161	103	95	67	66	60	50	39
4	43	431	362	313	161	103	95	66	58	59	55	49
5	44	284	231	312	163	101	86	66	58	57	55	46
6	44	229	215	275	163	101	88	66	58	55	52	48
7	44	213	214	275	163	101	86	65	60	55	50	47
8	43	213	362	239	145	102	86	64	62	51	50	48
9	43	199	761	209	145	101	88	63	62	52	51	48
10	248	185	1,900	210	129	101	83	61	62	53	51	48
11	130	172	1,470	241	115	137	83	66	66	52	61	42
12	84	171	972	241	115	107	83	67	66	64	52	48
13	59	171	642	209	115	105	83	67	67	66	51	46
14	56	231	508	210	115	105	80	67	67	66	51	44
15	146	230	507	208	145	106	81	67	71	64	50	46
16	133	230	448	207	129	106	86	67	69	66	50	45
17	90	171	397	182	131	106	105	66	70	66	50	46
18	74	158	398	183	129	103	93	66	66	68	50	48
19	65	159	398	182	115	106	95	59	70	63	50	48
20	62	159	353	161	114	106	88	60	64	65	51	46
21	59	146	312	161	115	106	89	60	60	62	50	46
22	57	146	312	160	115	105	89	59	59	60	47	46
23	55	159	312	161	115	105	111	58	59	59	48	46
24	62	158	313	160	115	106	111	60	58	55	50	46
25	186	146	313	159	115	106	111	63	57	61	48	47
26	127	146	313	160	115	96	111	67	65	64	48	45
27	103	158	313	160	114	95	73	67	70	72	48	45
28	76	158	313	160	113	95	78	67	73	58	48	46
29	1,220	.....	313	160	114	96	73	67	92	57	48	51
30	263	.....	313	160	115	96	67	63	91	55	48	47
31	230	.....	313	.....	103	.....	71	61	.....	52	.....	47

NOTE.—No water in canal on following days: Jan. 26, break in flume; June 11, plant shut down to repair flume; July 21–26, water turned out of canal to connect up No. 2 tunnel.

Combined monthly discharge of Santa Ana River and Pacific Light & Power Co.'s canal, including Greenspot pipe line, near Mentone, Cal., for 1911.

[Drainage area, 182 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	1,220	43	128	0.703	0.81	7,870	B.
February	431	146	197	1.08	1.12	10,900	A.
March	1,900	158	453	2.49	2.87	27,900	B.
April	313	159	213	1.17	1.30	12,700	A.
May	163	103	130	.714	.82	7,990	A.
June	137	95	104	.571	.64	6,190	A.
July	111	67	89.0	.489	.56	5,470	A.
August	71	58	64.5	.354	.41	3,970	A.
September	92	57	65.8	.362	.40	3,920	A.
October	79	51	60.6	.333	.38	3,730	A.
November	61	47	50.5	.277	.31	3,000	A.
December	51	39	46.3	.254	.29	2,850	A.
The year	1,900	39	133	.731	9.91	96,500	

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Daily discharge, in second-feet, of Pacific Light & Power Co.'s canal near Mentone, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	41	68	72	73	70	74	77	64	60	70	51	38
2	42	72	72	73	71	74	76	70	65	56	49	41
3	40	71	72	73	72	74	76	66	65	59	49	33
4	40	71	72	73	72	74	76	65	57	58	54	44
5	41	71	73	72	74	72	74	65	57	56	54	41
6	41	71	73	73	74	72	76	65	57	54	50	43
7	41	71	72	73	74	72	74	64	58	54	42	46
8	40	71	72	71	74	73	74	63	59	50	42	44
9	40	72	71	72	74	72	76	62	59	50	43	44
10	73	72	60	73	74	72	76	60	59	50	43	44
11	68	73	73	73	74	0	76	65	63	45	54	39
12	68	72	72	73	74	78	76	66	65	57	45	44
13	58	72	72	72	74	76	76	66	66	58	44	43
14	55	73	73	73	74	76	73	66	66	59	44	41
15	72	72	72	71	74	77	74	66	70	56	43	42
16	71	72	73	70	74	77	74	66	68	59	43	41
17	58	72	72	71	76	77	76	65	68	58	49	41
18	71	72	73	72	74	74	74	65	63	65	49	43
19	64	73	73	71	74	77	76	58	60	59	49	43
20	62	73	73	72	73	77	76	59	55	63	50	41
21	59	72	72	72	74	77	0	59	58	60	49	45
22	57	72	72	71	74	76	0	58	57	59	46	45
23	55	73	72	72	74	76	0	57	57	58	40	45
24	62	72	73	71	74	77	0	59	57	54	42	45
25	73	72	73	70	74	77	0	62	56	60	40	45
26	0	72	73	71	74	77	0	66	55	63	40	43
27	71	72	73	71	73	76	44	66	60	71	40	43
28	70	72	73	71	72	76	66	66	63	57	40	43
29	58	.....	73	71	73	77	72	66	66	56	40	48
30	70	.....	73	71	74	77	66	62	65	54	40	43
31	72	.....	73	.....	74	.....	70	60	.....	51	.....	43

NOTE.—On Sept. 7 the Greenspot pipe line began diverting water at the head gates. See footnote to combined daily discharge.

Monthly discharge of Pacific Light & Power Co.'s canal near Mentone, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	73	0	55.9	3,440	A.
February	73	68	71.8	3,990	A.
March	73	60	72.1	4,430	A.
April	73	70	71.8	4,270	A.
May	76	70	73.5	4,520	A.
June	78	0	72.8	4,330	A.
July	77	0	58.8	3,620	A.
August	70	57	63.5	3,900	A.
September	70	54	61.1	3,640	A.
October	71	45	57.4	3,530	A.
November	54	40	45.5	2,710	A.
December	48	33	42.7	2,630	A.
The year	78	0	62.2	45,000	

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Daily discharge, in second-feet, of Greenspot pipe line near Mentone, Cal., for 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	6.0	0.0	6.0	16	0.0	6.5	6.0	3.0
2	.....	6.0	.0	5.0	17	1.0	7.5	.0	3.5
3	.....	.0	.0	5.0	18	2.0	1.5	.0	3.5
4	.....	.0	.0	4.0	19	9.0	3.0	.0	3.5
5	.....	.0	.0	4.0	20	7.5	1.0	.0	3.5
6	.....	.0	.5	4.0	21	.5	1.0	.0	.0
7	1.3	.0	7.0	.0	22	.6	.0	.0	.0
8	1.6	.0	7.0	2.5	23	.6	.0	7.3	.0
9	1.6	1.0	7.0	2.5	24	.5	.4	7.3	.0
10	1.6	2.3	7.0	2.5	25	.0	.0	7.3	.8
11	1.8	6.5	6.0	2.5	26	9.1	.0	7.3	1.0
12	.0	6.5	6.0	2.5	27	9.0	.0	7.3	1.0
13	.0	6.5	6.0	2.5	28	9.0	.0	7.3	2.0
14	.0	6.5	6.0	2.5	29	7.0	.0	7.3	2.0
15	.0	6.5	6.0	3.0	30	7.0	.0	7.3	3.0
					31	.....	.0	.....	3.0

Monthly discharge of Greenspot pipe line near Mentone, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
September 7–30	9.1	0	2.95	140
October	7.5	0	2.22	136
November	7.3	0	4.10	244
December	6.0	0	2.53	156

WATERMAN CANYON CREEK NEAR SAN BERNARDINO, CAL.

Location.—Just above old toll bridge at mouth of canyon in the SW. ¼ SW. ¼ sec. 2, T. 1 N., R. 4 W., San Bernardino meridian, about 6 miles north of San Bernardino.

Records available.—November 2 to December 31, 1911.

Drainage area.—4.55 square miles.

Gage.—Vertical staff fastened to an alder tree on left bank about 300 feet above bridge.

Channel.—Bowlders and gravel; will shift at high stages.

Discharge measurements.—Made from foot plank 15 feet below gage and by wading.

Accuracy.—Results are fair.

The area drained by Waterman Canyon Creek was almost entirely burned over by a forest fire July 25 to August 4, 1911.

The following discharge measurement was made by F. C. Ebert by wading 100 feet below the gage:

November 2, 1911: Gage height, 1.62 feet; discharge, 1.8 second-feet.

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Daily gage height, in feet, and discharge, in second-feet, of Waterman Canyon Creek near San Bernardino, Cal., for 1911.

[H. E. Mastin, observer.]

Day.	November.		December.		Day.	November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1	.....	1.7	1.76	2.9	16	1.72	2.4	1.71	2.3
2	1.61	1.7	1.77	3.0	17	1.73	2.5	1.77	3.0
3	1.63	1.8	1.77	3.0	18	1.74	2.6	1.77	3.0
4	1.63	1.8	1.77	3.0	19	1.74	2.6	1.74	2.6
5	1.66	2.0	1.73	2.5	20	1.73	2.5	1.74	2.6
6	1.63	1.8	1.73	2.5	21	1.74	2.6	1.74	2.6
7	.....	1.9	1.81	3.5	22	1.74	2.6	1.76	2.9
8	1.66	2.0	1.79	3.2	23	1.74	2.6	1.77	3.0
9	1.67	2.0	1.77	3.0	24	1.74	2.6	1.76	2.9
10	1.67	2.0	1.77	3.0	25	1.74	2.6	1.76	2.9
11	1.72	2.4	1.73	2.5	26	1.74	2.6	1.76	2.9
12	1.69	2.1	1.71	2.3	27	1.74	2.6	1.76	2.9
13	1.69	2.1	1.71	2.3	28	1.74	2.6	1.79	3.2
14	1.69	2.1	1.72	2.4	29	1.76	2.9	1.79	3.2
15	1.69	2.1	1.72	2.4	30	1.76	2.9	1.81	3.5
					31	.....	.....	1.79	3.2

NOTE.—Daily discharge determined from a fairly well-defined rating curve. Discharge Nov. 1 estimated. Discharge Nov. 7 interpolated.

Monthly discharge of Waterman Canyon Creek near San Bernardino, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November	2.9	1.7	2.29	136	B.
December	3.5	2.3	2.85	175	B.

DEVIL CANYON CREEK NEAR SAN BERNARDINO, CAL.

Location.—At mouth of canyon, in the SE. ¼ NE. ¼ sec. 6, T. 1 N., R. 4 W., San Bernardino meridian, about 200 feet below ford, about 7 miles northwest of San Bernardino.

Records available.—November 1 to December 8, 1911.

Drainage area.—6.16 square miles.

Gage.—Vertical staff fastened to an alder tree on left bank about 200 feet below ford.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from foot plank about 75 feet below gage and by wading.

Accuracy.—Results are good.

Cooperation.—Gage-height record furnished by United States Forest Service.

The area drained by Devil Canyon Creek is similar in all respects to that tributary to Waterman Canyon except that it retains its forest cover.

The following discharge measurement was made by F. C. Ebert by wading 300 feet above gage:

November 1, 1911: Gage height, 1.48 feet; discharge, 2.1 second-feet.

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Daily gage height, in feet, and discharge, in second-feet, of Devil Canyon Creek near San Bernardino, Cal., for 1911.

[O. H. McElfresh, observer.]

Day.	November.		December.		Day.	November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.		Gage height.	Discharge.	Gage height.	Discharge.
1	1.46	2.0	1.53	2.4	16	1.50	2.2	.....	.....
2	1.47	2.1	1.53	2.4	17	1.50	2.2	.....	.....
3	1.48	2.1	1.52	2.3	18	1.49	2.2	.....	.....
4	1.49	2.2	1.56	2.6	19	1.49	2.2	.....	.....
5	1.49	2.2	1.54	2.4	20	1.50	2.2	.....	.....
6	1.49	2.2	1.62	3.0	21	1.52	2.3	.....	.....
7	1.50	2.2	1.61	2.9	22	1.54	2.4	.....	.....
8	1.51	2.3	1.59	2.7	23	1.54	2.4	.....	.....
9	1.52	2.3	.....	.....	24	1.57	2.6	.....	.....
10	1.69	3.8	.....	.....	25	1.56	2.6	.....	.....
11	1.56	2.6	.....	.....	26	1.54	2.4	.....	.....
12	1.52	2.3	.....	.....	27	1.54	2.4	.....	.....
13	1.52	2.3	.....	.....	28	1.55	2.5	.....	.....
14	1.52	2.3	.....	.....	29	1.55	2.5	.....	.....
15	1.50	2.2	.....	.....	30	1.54	2.4	.....	.....

NOTE.—Daily discharge determined from a fairly well-defined rating curve.

Monthly discharge of Devil Canyon Creek near San Bernardino, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
November	3.8	2.0	2.35	140	B.
December 1-8	3.0	2.3	2.59	41.1	B.

SAN GABRIEL RIVER BASIN.

SAN GABRIEL RIVER NEAR AZUSA, CAL.

Location.—Just above road crossing at mouth of canyon, in the NW. ¼ sec. 23, T. 1 N., R. 10 W., San Bernardino meridian, about one-fourth mile above Pacific Light & Power Co.'s power house, and 2 miles north of Azusa.

Records available.—1894 to December 31, 1911.

Drainage area.—222 square miles.

Gage.—Staff in five sections, beneath cable, just above ford; three vertical sections on posts in channel, one inclined and one vertical section bolted to rocks on left bank.

Channel.—Gravel and bowlders; will shift at high stages.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—The power canal of the Pacific Light & Power Co. heads about 5 miles above the station and diverts water past it. In addition there are several small irrigation ditches that divert water above the station.

Accuracy.—On account of change in channel results are only fair.

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Discharge measurements of San Gabriel River near Azusa, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 14[a]	W. V. Hardy	4.12	503
18	do	3.90	371
Mar. 14	do	5.52	2,110
23	do	5.10	963
Apr. 16	do	4.60	580
21[a]	do	4.20	350
May 16[b]	do	4.10	214
June 2[c]	do	3.90	121
22[d]	do	3.70	76
Nov. 4	Ebert and Lee	.....	0

[a] Made by wading directly beneath cable at gage section.
[b] San Gabriel River Water Co.'s canal diverted for irrigation about 10 second-feet above gage by a temporary dam under construction.
[c] San Gabriel River Water Co.'s canal diverted 6.2 second-feet.
[d] San Gabriel River Water Co.'s canal diverted 15 second-feet.

Daily gage height, in feet, of San Gabriel River near Azusa, Cal., for 1911.

[H. E. Ward and L. A. Petersen, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	5.0	3.7	4.7	4.1	3.9	3.4	2.8	.....	3.1	.....	.....
2	.....	4.5	3.7	4.8	4.1	3.8	3.4	.....	.....	2.8	.....	.....
3	.....	4.7	4.2	4.8	4.1	3.8	3.4	.....	.....	.....	.....	.....
4	.....	6.0	5.6	4.7	4.1	3.8	3.4	.....	.....	.....	.....	.....
5	.....	5.4	5.2	4.6	4.1	3.7	3.4	.....	.....	.....	.....	.....
6	.....	4.9	5.0	4.6	4.1	3.7	3.4	.....	.....	.....	.....	.....
7	.....	4.6	5.0	4.6	4.1	3.7	3.3	.....	.....	.....	.....	.....
8	.....	4.4	6.2	4.5	4.1	3.7	3.3	.....	.....	.....	.....	.....
9	.....	4.5	8.05	4.5	4.1	3.7	3.3	.....	.....	.....	.....	.....
10	4.5	4.3	8.6	4.4	4.1	3.6	3.3	.....	.....	.....	.....	.....
11	3.5	4.3	6.7	4.4	4.1	3.6	3.3	.....	.....	.....	.....	.....
12	2.9	4.3	6.2	4.4	4.1	3.6	3.3	.....	.....	.....	.....	.....
13	2.5	4.3	5.6	4.4	4.0	3.6	3.3	.....	.....	.....	.....	.....
14	2.1	4.3	5.5	4.4	4.3	3.6	3.2	.....	.....	.....	.....	.....
15	4.8	4.2	5.4	4.3	4.1	3.5	3.2	.....	.....	.....	.....	.....
16	3.9	4.1	5.4	4.3	4.1	3.5	3.2	.....	.....	.....	.....	.....
17	3.4	4.0	5.3	4.3	4.1	3.5	3.2	.....	.....	.....	.....	.....
18	3.1	3.9	5.3	4.3	4.1	3.5	3.2	.....	.....	.....	.....	.....
19	2.9	3.8	5.3	4.3	4.0	3.5	3.2	.....	.....	.....	.....	.....
20	2.8	3.7	5.2	4.2	4.0	3.5	3.2	.....	.....	.....	.....	.....
21	2.7	3.7	5.2	4.2	4.2	3.5	3.2	.....	.....	.....	.....	.....
22	2.6	3.6	5.1	4.2	4.0	3.5	3.2	.....	.....	.....	.....	.....
23	2.5	3.6	5.1	4.2	4.0	3.5	3.2	.....	.....	.....	.....	.....
24	2.4	3.5	5.0	4.2	3.9	3.4	3.1	.....	.....	.....	.....	.....
25	4.5	3.5	5.0	4.2	3.9	3.4	3.1	.....	.....	.....	.....	.....
26	4.0	3.5	4.9	4.2	3.9	3.4	3.0	.....	.....	.....	.....	.....
27	3.7	3.7	4.9	4.2	3.9	3.4	3.0	.....	.....	.....	.....	.....
28	3.6	3.7	4.8	4.2	3.9	3.4	2.9	.....	.....	.....	.....	.....
29	7.0	.....	4.8	4.1	3.9	3.4	2.9	.....	.....	.....	.....	.....
30	5.1	.....	4.7	4.1	3.9	3.4	2.9	.....	3.4	.....	.....	.....
31	6.5	.....	4.7	.....	3.9	.....	2.9	.....	.....	.....	.....	.....

NOTE.—No flow Jan. 1 to 8, Aug. 1 to Sept. 28 and Oct. 2 to Dec. 31.

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Daily discharge, in second-feet, of San Gabriel River near Azusa, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	1,540	235	580	246	128	28	0	0	7	0	0
2	0	900	235	680	245	98	28	0	0	0	0	0
3	0	1,140	585	690	243	98	28	0	0	0	0	0
4	0	3,180	2,470	590	241	98	28	0	0	0	0	0
5	0	2,140	1,830	500	239	76	28	0	0	0	0	0
6	0	1,400	1,540	510	238	76	28	0	0	0	0	0
7	0	1,020	1,540	520	236	76	19	0	0	0	0	0
8	0	785	3,560	430	234	76	19	0	0	0	0	0
9	100	900	7,660	440	232	76	19	0	0	0	0	0
10	1,070	680	9,100	360	231	57	19	0	0	0	0	0
11	200	680	4,500	370	229	57	19	0	0	0	0	0
12	50	680	3,430	375	227	57	19	0	0	0	0	0
13	16	680	2,300	380	175	57	19	0	0	0	0	0
14	2	680	2,060	390	360	57	12	0	0	0	0	0
15	1,440	585	1,820	310	218	41	12	0	0	0	0	0
16	455	500	1,780	320	217	41	12	0	0	0	0	0
17	153	420	1,570	325	217	41	12	0	0	0	0	0
18	78	350	1,520	350	217	41	12	0	0	0	0	0
19	50	290	1,470	375	168	41	12	0	0	0	0	0
20	39	235	1,270	325	168	41	12	0	0	0	0	0
21	30	235	1,200	350	280	41	12	0	0	0	0	0
22	22	185	1,020	345	168	41	12	0	0	0	0	0
23	16	185	963	345	168	41	12	0	0	0	0	0
24	11	140	840	340	128	28	7	0	0	0	0	0
25	1,070	140	850	340	128	28	7	0	0	0	0	0
26	541	140	730	335	128	28	3	0	0	0	0	0
27	312	235	740	335	128	28	3	0	0	0	0	0
28	253	235	640	330	128	28	1	0	0	0	0	0
29	5,190	.....	650	250	128	28	1	0	50	0	0	0
30	1,680	.....	560	248	128	28	1	0	28	0	0	0
31	4,150	.....	570	.....	128	.....	1	0	.....	0	.....	0

NOTE.—Daily discharge determined from three rather poorly defined rating curves applicable Jan. 1, 1910 to Jan. 29, 1911, Jan. 30 to Mar. 10, 1911, and May 16 to Dec. 31, 1911. Indirect method for shifting channels was used Mar. 11 to May 15. Daily discharge estimated Jan. 9 and Sept. 29 from precipitation records and observer's notes. Estimates roughly approximate.

Monthly discharge of San Gabriel River near Azusa, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	5,190	0	546	33,600	C.
February	3,180	140	724	40,200	B.
March	9,100	235	1,910	117,000	C.
April	690	248	401	23,900	B.
May	360	128	201	12,400	B.
June	128	28	55.1	3,280	C.
July	28	1	14.4	885	D.
August	0	0	.0	0	
September	50	0	2.6	155	D.
October	7	0	.2	12	D.
November	0	0	.0	0	
December	0	0	.0	0	
The year	9,100	0	320	231,000	

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Combined daily discharge, in second-feet, of San Gabriel River and canal near Azusa, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	33	1,610	310	650	310	200	99	69	45	74	49	44
2	33	968	310	753	316	170	72	69	46	70	49	43
3	33	1,210	660	763	314	170	99	69	47	66	45	43
4	33	3,250	2,540	664	312	169	99	69	46	60	45	44
5	33	2,210	1,900	574	310	147	100	68	48	56	46	45
6	32	1,470	1,610	584	309	146	100	68	49	55	47	50
7	32	1,090	1,610	594	307	146	91	68	48	52	47	56
8	32	856	3,630	504	305	148	91	66	46	51	46	49
9	137	972	7,720	514	303	147	91	65	47	52	47	47
10	1,110	753	9,160	434	302	129	91	65	46	51	49	46
11	261	752	4,560	444	299	129	91	64	44	51	52	46
12	112	752	3,490	449	297	128	91	61	43	50	51	45
13	80	752	2,360	454	245	128	91	60	44	48	50	45
14	68	752	2,120	464	400	129	83	58	43	47	50	46
15	1,510	657	1,880	384	288	112	84	59	43	45	49	46
16	525	572	1,840	394	288	112	84	58	41	44	50	46
17	222	495	1,630	399	288	113	84	56	41	45	47	48
18	152	425	1,590	424	289	113	84	56	41	45	46	48
19	125	365	1,490	449	240	113	84	54	40	45	47	47
20	114	310	1,340	398	240	113	84	54	40	44	47	47
21	104	308	1,270	423	334	113	84	54	41	44	47	47
22	96	260	1,090	418	239	113	84	54	41	44	47	45
23	90	260	1,030	418	240	112	84	52	42	44	47	46
24	85	215	909	412	200	99	79	52	42	44	46	45
25	1,140	215	919	412	200	99	79	51	42	44	46	45
26	615	215	802	407	200	99	75	52	42	45	43	45
27	386	310	811	406	200	99	75	52	42	53	44	46
28	327	310	711	402	200	99	71	51	42	55	44	47
29	5,260	.....	721	321	200	99	71	50	113	53	44	54
30	1,750	.....	630	320	200	99	71	49	94	53	44	50
31	4,220	.....	638	.....	200	.....	71	46	.....	51	.....	48

Combined monthly discharge of San Gabriel River and canal near Azusa, Cal., for 1911.

[Drainage area, 222 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	5,260	32	605	2.73	3.15	37,200
February	3,250	215	797	3.59	3.74	44,300
March	9,160	310	1,980	8.92	10.28	122,000
April	763	320	474	2.14	2.39	28,200
May	400	200	270	1.22	1.41	16,600
June	200	99	126	.568	.63	7,500
July	100	71	85.1	.383	.44	5,230
August	69	46	58.7	.264	.30	3,610
September	113	40	47.6	.214	.24	2,830
October	74	44	51.0	.230	.27	3,140
November	52	43	47.0	.212	.24	2,800
December	56	43	46.7	.210	.24	2,870
The year	9,160	32	381	1.72	23.33	276,000

NOTE.—This table does not include any diversion above the station except the Pacific Light & Power Co.'s canal. Hence the discharge per square mile and the run-off in inches are subject to considerable error during the irrigation season.

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PACIFIC LIGHT & POWER CO.'S CANAL[1] NEAR AZUSA, CAL.

Location.—At Pacific Light & Power Co.'s power house, about 1¼ miles north of Azusa.

Records available.—1896 to December 31, 1911.

Discharge.—Computed from records showing kilowatt output of plant.

Accuracy.—In compiling these records it is considered that 1 second-foot develops 25 kilowatts. Results are believed to be good.

Daily discharge, in second-feet, of Pacific Light & Power Co.'s canal near Azusa, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	33	70	75	70	64	72	71	69	45	67	49	44
2	33	68	75	73	71	72	44	69	46	70	49	43
3	33	69	75	73	71	72	71	69	47	66	45	43
4	33	70	67	74	71	71	71	69	46	60	45	44
5	33	72	71	74	71	71	72	68	48	56	46	45
6	32	72	68	74	71	70	72	68	49	55	47	50
7	32	73	66	74	71	70	72	68	48	52	47	56
8	32	71	71	74	71	72	72	66	46	51	46	49
9	37	72	65	74	71	71	72	65	47	52	47	47
10	44	73	55	74	71	72	72	65	46	51	49	46
11	61	72	58	74	70	72	72	64	44	51	52	46
12	62	72	60	74	70	71	72	61	43	50	51	45
13	64	72	60	74	70	71	72	60	44	48	50	45
14	66	72	61	74	40	72	71	58	43	47	50	46
15	68	72	60	74	70	71	72	59	43	45	49	46
16	70	72	63	74	71	71	72	58	41	44	50	46
17	69	75	64	74	71	72	72	56	41	45	47	48
18	74	75	68	74	72	72	72	56	41	45	46	48
19	75	75	24	74	72	72	72	54	40	45	47	47
20	75	75	73	73	72	72	72	54	40	44	47	47
21	74	73	71	73	54	72	72	54	41	44	47	47
22	74	75	69	73	71	72	72	54	41	44	47	45
23	74	75	69	73	72	71	72	52	42	44	47	46
24	74	75	69	72	72	71	72	52	42	44	46	45
25	74	75	69	72	72	71	72	51	42	44	46	45
26	74	75	72	72	72	71	72	52	42	45	43	45
27	74	75	71	71	72	71	72	52	42	53	44	46
28	74	75	71	72	72	71	70	51	42	55	44	47
29	74	.....	71	71	72	71	70	50	63	53	44	54
30	74	.....	70	72	72	71	70	49	66	53	44	50
31	74	.....	68	.....	72	.....	70	46	.....	51	.....	48

NOTE.—Jan. 18, full head of water turned in at headgate of canal; Feb. 1–5 and 21, part of water out o canal in the afternoon; Mar. 4, part of water out of canal; Mar. 19, May 14, May 21, and July 2, all water out of canal part of day. Allowance made for deficiency of discharge on above dates.

Monthly discharge of Pacific Light & Power Co.'s canal near Azusa, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
January	75	32	59.4	3,650
February	75	68	72.9	4,050
March	75	24	66.1	4,060
April	74	70	73.1	4,350
May	72	40	69.5	4,270
June	72	70	71.4	4,250
July	72	44	70.7	4,350
August	69	46	58.7	3,610
September	66	40	45.0	2,680
October	70	44	50.8	3,120
November	52	43	47.0	2,800
December	56	43	46.7	2,870
The year	75	24	60.9	44,100

NOTE.—Accuracy not known.

[1] Formerly known as San Gabriel power canal.

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LOS ANGELES RIVER BASIN.

ARROYO SECO NEAR PASADENA, CAL.

Location.—Just below highway crossing at forest ranger's station in the Angeles National Forest, near south line of sec. 30, T. 2 N., R. 12 W. (unsurveyed), about 3 miles above Devils Gate and 5½ miles northwest of Pasadena.

Records available.—December 1, 1910, to December 31, 1911.

Drainage area.—16.4 square miles.

Gage.—Staff in two sections fastened to an alder tree on right bank 300 feet southeast of ranger's cabin.

Channel.—Solid rock and gravel and somewhat shifting.

Discharge measurements.—Made by wading below gage.

Accuracy.—Results are considered fairly good.

Cooperation.—Gage height record furnished by United States Forest Service.

Discharge measurements of Arroyo Seco near Pasadena, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 22	W. V. Hardy	3.78	18
Mar. 1	.....do	3.85	22
May 2	.....do	3.47	13
June 21	.....do	3.30	4.8
Nov. 3	F. C. Ebert	3.14	1.6
3	Lasley Lee	3.14	1.6

NOTE.—Measurements were made by wading below the gage.

Daily gage height, in feet, of Arroyo Seco near Pasadena, Cal., for 1911.

[Gale J. Dunston, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.92	.....	3.36	3.25	3.13	3.01	.....	3.21	3.16
2	3.91	.....	3.35	3.24	.....	3.01	3.25	3.22	3.16
3	3.91	3.54	3.35	3.23	.....	3.01	3.24	3.20	.....
4	3.90	3.48	3.34	3.22	.....	3.00	3.23	3.19	3.17
5	3.86	3.46	3.33	3.22	.....	3.00	3.20	.....	3.16
6	3.79	3.44	3.32	3.22	.....	3.00	3.19	3.19	3.21
7	3.75	.....	3.32	3.21	.....	3.00	3.21	3.18	3.20
8	3.71	3.40	3.31	3.20	.....	3.00	.....	3.18	3.20
9	3.62	3.39	3.31	3.18	.....	3.01	3.19	3.17	3.20
10	3.62	3.39	3.30	3.17	3.12	3.01	3.18	3.24	.....
11	3.61	3.38	3.29	3.16	3.12	3.01	3.17	3.22	3.19
12	3.59	3.38	3.28	3.15	3.12	3.01	3.15	.....	3.18
13	3.59	3.37	3.28	3.15	.....	3.02	3.15	3.21	3.18
14	3.57	3.39	3.28	3.15	3.13	3.02	3.19	3.20	3.18
15	3.56	3.39	3.28	3.15	3.12	3.02	.....	3.19	3.17
16	.....	3.39	3.27	3.15	3.11	3.02	3.14	3.19	3.16
17	3.54	3.39	3.27	3.14	3.12	3.01	3.14	3.18	.....
18	3.51	3.39	3.27	3.14	3.11	3.01	3.14	3.18	3.17
19	3.50	3.38	3.27	3.14	3.10	3.02	3.14	3.18	3.17
20	3.49	.....	3.27	3.15	3.09	3.01	3.14	3.17	3.17
21	.....	.....	3.27	3.14	3.07	3.01	3.15	3.16	3.17
22	3.49	.....	3.26	3.14	3.06	3.02	3.15	3.15	3.16
23	.....	.....	3.26	3.14	3.06	3.02	3.16	3.15	.....
24	3.48	.....	3.26	3.15	3.05	3.03	3.17	3.15	.....
25	3.47	.....	3.26	3.15	3.05	3.04	3.17	3.14	.....
25	3.58	.....	3.25	3.15	3.05	3.04	3.18	3.14	.....
27	3.58	.....	3.25	3.15	3.05	3.04	3.20	3.15	.....
28	3.57	.....	3.25	3.15	3.04	3.09	3.22	3.15	.....
29	.....	.....	3.25	3.15	3.03	3.90	3.21	3.16	.....
30	.....	3.36	3.25	3.15	3.02	3.68	3.20	3.15	.....
31	.....	3.36	.....	3.14	3.01	.....	3.21	.....	.....

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Daily discharge, in second-feet, of Arroyo Seco near Pasadena, Cal., for 1910–11.

Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.
1910.		1910.		1910.		1910.		1910.		1910.	
1	1.4	6	2.1	11	2.1	16	4.2	21	5.0	26	7.0
2	1.6	7	2.1	12	2.0	17	4.2	22	5.6	27	7.5
3	1.7	8	2.0	13	2.3	18	4.6	23	5.6	28	7.5
4	1.8	9	2.1	14	2.8	19	4.6	24	6.0	29	7.0
5	2.0	10	2.0	15	3.9	20	5.0	25	7.0	30	7.0
										31	7.5

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.									
1	63	19	7.2	3.2	1.3	0.6	17	2.2	1.6
2	62	19	6.8	3.0	1.3	.6	3.2	2.5	1.6
3	62	18	6.8	2.8	1.3	.6	3.0	2.0	1.6
4	60	14	6.3	2.5	1.3	.5	2.8	1.9	1.7
5	54	13	5.8	2.5	1.3	.5	2.0	1.9	1.6
6	44	11	5.4	2.5	1.2	.5	1.9	1.9	2.2
7	39	10	5.4	2.2	1.2	.5	2.2	1.8	2.0
8	34	9.0	5.0	2.0	1.2	.5	2.0	1.8	2.0
9	25	8.6	5.0	1.8	1.2	.6	1.9	1.7	2.0
10	25	8.6	4.5	1.7	1.2	.6	1.8	3.0	2.0
11	24	8.1	4.2	1.6	1.2	.6	1.7	2.5	1.9
12	22	8.1	4.0	1.5	1.2	.6	1.5	2.4	1.8
13	22	7.6	4.0	1.5	1.2	.6	1.5	2.2	1.8
14	21	8.6	4.0	1.5	1.3	.6	1.9	2.0	1.8
15	20	8.6	4.0	1.5	1.2	.6	1.6	1.9	1.7
16	19	8.6	3.8	1.5	1.1	.6	1.4	1.9	1.6
17	18	8.6	3.8	1.4	1.2	.6	1.4	1.8	1.6
18	16	8.6	3.8	1.4	1.1	.6	1.4	1.8	1.7
19	15	8.1	3.8	1.4	1.0	.6	1.4	1.8	1.7
20	14	8.0	3.8	1.5	1.0	.6	1.4	1.7	1.7
21	14	7.9	3.8	1.4	.8	.6	1.5	1.6	1.7
22	14	7.9	3.5	1.4	.8	.6	1.5	1.5	1.6
23	14	7.8	3.5	1.4	.8	.6	1.6	1.5	1.6
24	14	7.7	3.5	1.5	.8	.6	1.7	1.5	1.6
25	13	7.6	3.5	1.5	.8	.7	1.7	1.4	1.6
26	21	7.5	3.2	1.5	.8	.7	1.8	1.4	1.5
27	21	7.4	3.2	1.5	.8	.7	2.0	1.5	1.5
28	21	7.4	3.2	1.5	.7	1.0	2.5	1.5	1.5
29	20	7.3	3.2	1.5	.6	60	2.2	1.6	1.5
30	20	7.2	3.2	1.5	.6	31	2.0	1.5	1.5
31	.....	7.2	.....	1.4	.6	.....	2.2	.....	1.5

NOTE.—Daily discharge determined from two rating curves fairly well defined below 20 second-feet and applicable Dec. 1, 1910, to Mar. 10, 1911, and Mar. 11 to Dec. 31, 1911. Discharge interpolated for days on which gage was not read.

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Monthly discharge of Arroyo Seco near Pasadena, Cal., for 1910–11.

[Drainage area, 16.4 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area).	Total in acre-feet.	
1910.							
December	7.5	1.4	4.10	0.250	0.29	252	C.
1911.							
April	63	13	27.7	1.69	1.89	1,650	B.
May	19	7.2	9.55	.582	.67	587	B.
June	7.2	3.2	4.37	.266	.30	260	C.
July	3.2	1.4	1.78	.109	.13	109	D.
August	1.3	.6	1.04	.063	.07	64	D.
September	60	.5	3.60	.220	.25	214	D.
October	17	1.4	2.38	.145	.17	146	D.
November	3.0	1.4	1.86	.113	.13	111	D.
December	2.2	1.5	1.70	.104	.12	105	D.
The period						3,250	

SANTA CLARA RIVER BASIN.

SANTA CLARA RIVER AT FILLMORE, CAL.

Location.—At highway bridge at Fillmore, in the NW. ¼ sec. 31, T. 4 N., R. 19 W., about 1½ miles above mouth of Sespe Creek and half a mile southwest of Fillmore.

Records available.—August 31 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to piling near right end of bridge.

Channel.—Shifting sand.

Discharge measurements.—Made from bridge at gage and by wading.

Diversions.—Water diverted for irrigation from main river and tributaries above the station.

Accuracy.—Discharge computed by indirect method for shifting channels. Results are approximate.

Discharge measurements of Santa Clara River at Fillmore, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 31[a]	F. C. Ebert	3.16	36
Oct. 25[b]	....do	2.40	23
25[b]	Lesley Lee	2.40	23

[a] Made by wading 300 feet above gage. [b] Made by wading under highway bridge at gage.

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Daily gage height, in feet, and discharge, in second-feet, of Santa Clara River at Fillmore, Cal., for 1911.

[William M. Zenor, observer.]

Day.	September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	3.15	36	3.15	43	2.45	26	2.45	31
2	3.15	36	3.15	45	2.45	26	2.45	31
3	3.25	41	3.15	45	2.45	26	2.45	31
4	3.3	43	3.15	45	2.45	26	2.45	31
5	3.15	36	3.0	39	2.45	26	2.45	31
6	3.15	36	3.0	39	2.45	26	2.45	31
7	3.15	36	3.15	45	2.45	27	2.45	31
8	3.15	39	3.15	45	2.45	27	2.45	31
9	3.0	34	3.15	45	2.45	27	2.45	31
10	3.15	39	3.25	51	2.45	27	2.45	31
11	3.15	39	3.15	47	2.45	27	2.25	25
12	3.15	39	3.0	41	2.45	27	2.25	25
13	3.15	39	3.0	41	2.45	28	2.25	25
14	3.15	39	3.25	51	2.45	28	2.25	25
15	3.15	39	3.0	41	2.45	28	2.25	25
16	3.15	41	3.0	41	2.45	28	2.25	25
17	3.0	36	3.0	41	2.45	28	2.25	25
18	3.0	36	3.15	49	2.45	28	2.25	25
19	3.15	41	3.15	49	2.45	29	2.25	25
20	3.25	45	3.0	43	2.45	29	2.25	25
21	3.15	41	3.0	43	2.45	29	2.25	26
22	3.0	36	3.0	43	2.45	29	2.25	26
23	3.15	43	3.15	49	2.45	29	2.25	26
24	.....	43	2.45	24	2.45	29	2.25	26
25	.....	43	2.45	24	2.45	30	2.25	26
26	.....	43	2.45	25	2.45	30	2.25	26
27	.....	43	2.45	25	2.45	30	2.25	26
28	.....	43	2.45	25	2.45	30	2.25	26
29	.....	43	2.45	25	2.45	30	2.25	26
30	.....	43	2.45	25	2.45	30	2.25	26
31	.....	.....	2.45	25	.....	.....	2.25	26

NOTE.—Daily discharge determined by indirect method for shifting channels.

Monthly discharge of Santa Clara River at Fillmore, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
September	45	34	39.7	2,360	D.
October	51	24	39.3	2,420	D.
November	30	26	28.0	1,670	D.
December	31	25	27.3	1,680	D.

PIRU CREEK NEAR PIRU, CAL.

Location.—Below suspension footbridge in southern part of Temescal grant in Santa Barbara National Forest, 2 miles above junction with Santa Clara River and about 1¼ miles northeast of Piru.

Records available.—October 28 to December 31, 1911.

Drainage area.—432 square miles.

Gage.—Vertical staff in two sections fastened to cottonwood tree on right bank, about 300 feet below bridge.

Channel.—Gravel and sand; shifting.

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Discharge measurements.—Made from bridge above gage and by wading.
Diversions.—Water is diverted above the station, through a 4-inch pipe, for municipal purposes at Piru.
Accuracy.—Estimates are withheld until additional data are available.
Cooperation.—Gage-height record furnished by United States Forest Service.

The following discharge measurement was made by F. C. Ebert by wading at the gage:

October 28, 1911: Gage height, 2.57 feet; discharge, 30 second-feet.

Daily gage height, in feet, of Piru Creek near Piru, Cal., for 1911.

[George C. Hollister, observer.]

Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.
1			11			21		
2			12			22		
3			13			23		
4			14		2.01	24		
5			15			25		
6			16			26		
7			17			27		
8			18			28	2.57	
9		2.01	19		2.01	29		
10		2.01	20			30	2.57	
						31		

SESPE CREEK AT SESPE, CAL.

Location.—At Southern Pacific Railroad bridge in the NW. ¼ sec. 25, T. 4 N., R. 20 W., 1½ miles above junction with Santa Clara River and one-half a mile southeast of Sespe.
Records available.—August 31 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Inclined staff in two sections on left bank at bridge.
Channel.—Gravel and will shift at high stages.
Discharge measurements.—Made from railroad bridge and by wading.
Diversions.—The Fillmore Irrigation Co.'s canal, which diverts about 4 miles above the station, furnishes water for irrigation and domestic uses at Sespe and Fillmore.
Accuracy.—Results are good.

Discharge measurements of Sespe Creek at Sespe, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 31 [a]	F. C. Ebert	4.18	7.3
Oct. 26 [b]	Lasley Lee	4.20	7.0

[a] Made by wading 200 feet below gage. [b] Made by wading 300 feet below gage.

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Daily gage height, in feet, and discharge, in second-feet, of Sespe Creek at Sespe, Cal., for 1911.

[J. R. Fleming and Edward Perkins, observers.]

Day.	August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	4.20	7.0	4.38	16	4.00	10	4.33	13
2	.....	.....	4.20	7.0	4.35	14	3.90	10	4.35	14
3	.....	.....	4.20	7.0	4.35	14	3.83	10	4.33	13
4	.....	.....	4.22	7.9	4.33	13	3.90	10	4.35	14
5	.....	.....	4.20	7.0	4.33	13	3.93	10	4.35	14
6	.....	.....	4.20	7.0	4.33	13	3.95	10	4.40	17
7	.....	.....	4.22	7.9	4.30	11	4.25	9.2	4.45	20
8	.....	.....	4.22	7.9	4.30	11	4.28	10	4.50	23
9	.....	.....	4.22	7.9	4.30	11	4.28	10	4.45	20
10	.....	.....	4.22	7.9	4.30	11	4.28	10	4.45	20
11	.....	.....	4.22	7.9	4.28	10	4.28	10	4.45	20
12	.....	.....	4.25	9.2	4.28	10	4.10	12	4.45	20
13	.....	.....	4.25	9.2	4.28	10	4.10	12	4.43	19
14	.....	.....	4.25	9.2	4.40	17	4.35	14	4.43	19
15	.....	.....	4.28	10	4.30	11	4.40	17	4.43	19
16	.....	.....	4.28	10	4.33	13	4.38	16	4.45	20
17	.....	.....	4.28	10	4.33	13	4.35	14	4.43	19
18	.....	.....	4.28	10	4.28	10	4.35	14	4.40	17
19	.....	.....	4.20	7.0	4.25	9.2	4.38	16	4.40	17
20	.....	.....	4.20	7.0	4.22	7.9	4.35	14	4.43	19
21	.....	.....	4.20	7.0	4.20	7.0	4.35	14	4.43	19
22	.....	.....	4.20	7.0	4.20	7.0	4.33	13	4.45	20
23	.....	.....	4.25	9.2	4.20	7.0	4.33	13	4.45	20
24	.....	.....	4.30	11	4.20	7.0	4.33	13	4.43	19
25	.....	.....	4.30	11	4.18	6.4	4.30	11	4.43	19
26	.....	.....	4.30	11	4.20	7.0	4.33	13	4.43	19
27	.....	.....	4.30	11	4.25	9.2	4.33	13	4.45	20
28	.....	.....	4.30	11	4.28	10	4.30	11	4.45	20
29	.....	.....	4.30	11	4.30	11	4.33	13	4.45	20
30	.....	.....	4.32	12	4.30	11	4.33	13	4.45	20
31	4.18	6.4	.....	.....	4.28	10	.....	.....	4.43	19

NOTE.—During October and November a retaining wall was under construction just above the county bridge to shut water out of an old channel made by the preceding winter's flood. Water was diverted through this old channel to facilitate construction about Nov. 1–6 and 12–13. Discharge of river was not registered by the gage on these days. Daily discharge determined from a well-defined rating curve. Discharge interpolated Nov. 1–6 and 12–13.

Monthly discharge of Sespe Creek at Sespe, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
September	12	7.0	8.84	526	B.
October	17	6.4	10.7	658	B.
November	17	9.2	12.2	726	B.
December	23	13.0	18.5	1,140	B.

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SANTA PAULA CREEK NEAR SANTA PAULA, CAL.

Location.—Just below mouth of Sisar Creek, at east boundary of Ojai grant, in Santa Barbara National Forest, 6 miles above junction with Santa Clara River and about 5½ miles northwest of Santa Paula.

Records available.—October 27 to December 31, 1911.

Drainage area.—33.4 square miles.

Gage.—Vertical staff fastened to tree on left bank about 600 feet below mouth of Sisar Creek.

Channel.—Bowlders and gravel; will shift at high stages.

Discharge measurements.—Made from highway bridge 1 mile below gage and by wading.

Cooperation.—Gage-height record furnished by United States Forest Service.

Only gage height recorded by observer was on December 31, when the reading was 2.45 feet.

Discharge measurements of Santa Paula Creek near Santa Paula, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 27[a]	F. C. Ebert	2.40	4.9
27[a]	Lasley Lee	2.40	4.8

[a] Made by wading 100 feet above gage.

VENTURA RIVER BASIN.

VENTURA RIVER NEAR NORDHOFF, CAL.

Location.—Just below junction of Matilija and North Fork of Matilija creeks, in the N. ¼ SW. ¼ sec. 28, T. 5 N., R. 23 W., about 4 miles northwest of Nordhoff.

Records available.—October 23 to December 31, 1911.

Drainage area.—19.9 square miles.

Gage.—Vertical staff in three sections on right bank about 300 feet below junction of creeks.

Channel.—Gravel and bowlders; may shift during high water.

Discharge measurements.—Made from suspension footbridge 1 mile below gage and by wading.

Diversions.—A small ditch takes water for domestic uses from the North Fork of Matilija Creek above the station.

Accuracy.—Results are good.

Discharge measurements of Ventura River near Nordhoff, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 23[a]	F. C. Ebert	2.18	11
23[a]	Lasley Lee	2.18	11

[a] Made by wading 500 feet below gage.

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Daily gage height, in feet, and discharge, in second-feet, of Ventura River near Nordhoff, Cal., for 1911.

[P. W. Soper, observer.]

Day.	October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.25	13	2.20	12
2			2.22	12	2.20	12
3			2.22	12	2.20	12
4			2.22	12	2.25	13
5			2.22	12	2.25	13
6			2.22	12	2.60	27
7			2.22	12	2.35	17
8			2.22	12	2.30	15
9			2.22	12	2.30	15
10			2.22	12	2.30	15
11			2.25	13	2.30	15
12			2.25	13	2.30	15
13			2.25	13	2.30	15
14			2.25	13	2.30	15
15			2.25	13	2.30	15
16			2.22	12	2.28	14
17			2.22	12	2.28	14
18			2.22	12	2.28	14
19			2.22	12	2.28	14
20			2.22	12	2.28	14
						14
21			2.22	12	2.28	14
22			2.22	12	2.28	
23	2.18	11	2.25	13	2.28	14
24	2.20	12	2.20	12	2.28	14
25	2.20	12	2.20	12	2.28	14
26	2.22	12	2.20	12	2.28	14
27	2.25	13	2.20	12	2.28	14
28	2.28	14	2.20	12	2.32	16
29	2.25	13	2.20	12	2.32	16
30	2.25	13	2.20	12	2.30	15
31	2.25	13			2.30	15

NOTE.—Daily discharge determined from a fairly well defined curve.

Monthly discharge of Ventura River near Nordhoff, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October 23-31	14	11	12.6	225	B.
November	13	12	12.2	726	B.
December	27	12	14.7	904	B.

VENTURA RIVER NEAR VENTURA, CAL.

Location.—At highway bridge in Foster Memorial Park near southeast corner of Santa Ana grant, below Ventura Water Co.'s diversion dam, one-fourth mile below mouth of Coyote Creek, and about 5 miles north of Ventura and mouth of river.

Records available.—September 4 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Chain gage at bridge. Length of chain 28.14 feet.

Channel.—Gravel and bowlders; may shift during high water.

Discharge measurements.—Made from bridge at gage and by wading.

Diversions.—Diversion for irrigation from main river and tributaries above the station. Pipe line for irrigation and municipal water supply in the vicinity of Ventura heads just above the dam.

Accuracy.—Results are fairly good.

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Discharge measurements of Ventura River near Ventura, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 4	F. C. Ebert	1.71	24
Oct. 24	....do	1.70	18
24	Lasley Lee	1.70	18

NOTE.—Measurements were made by wading 100 feet below the gage.

Daily gage height, in feet, and discharge, in second-feet, of Ventura River near Ventura, Cal., for 1911.

[J. B. Train, observer.]

Day.	September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	1.70	21	1.70	21	1.70	21
2	.....	.....	1.72	23	1.70	21	1.70	21
3	.....	.....	1.70	21	1.70	21	1.70	21
4	1.72	23	1.70	21	1.70	21	1.70	21
5	1.72	23	1.70	21	1.70	21	1.70	21
6	1.72	23	1.72	23	1.70	21	1.78	27
7	1.72	23	1.70	21	1.70	21	1.78	27
8	1.72	23	1.68	20	1.70	21	1.78	27
9	1.72	23	1.70	21	1.70	21	1.78	27
10	.....	23	1.68	20	1.70	21	1.75	25
11	1.72	23	1.68	20	1.70	21	1.75	25
12	1.72	23	1.70	21	1.70	21	1.75	25
13	1.72	23	1.70	21	1.70	21	1.75	25
14	1.72	23	1.70	21	1.70	21	1.75	25
15	1.70	21	1.70	21	1.70	21	1.78	27
16	1.68	20	1.70	21	1.70	21	1.78	27
17	1.70	21	1.65	18	1.70	21	1.78	27
18	1.65	18	1.70	21	1.70	21	1.75	25
19	1.60	14	1.65	18	1.70	21	1.75	25
20	1.68	20	1.68	20	1.70	21	1.75	25
21	1.65	18	1.70	21	1.70	21	1.75	25
22	1.68	20	1.70	21	1.70	21	1.75	25
23	1.70	21	1.70	21	1.70	21	1.75	25
24	1.68	20	1.70	21	1.70	21	1.75	25
25	1.68	20	1.70	21	1.70	21	1.75	25
26	1.68	20	1.70	21	1.70	21	1.75	25
27	1.65	18	1.70	21	1.70	21	1.75	25
28	1.70	21	1.70	21	1.70	21	1.75	25
29	1.70	21	1.70	21	1.70	21	1.75	25
30	1.70	21	1.70	21	1.70	21	1.75	25
31	.....	.....	1.70	21	.....	.....	1.75	25

NOTE.—Daily discharge determined from a well-defined rating curve.

Monthly discharge of Ventura River near Ventura, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
September 4–30	23	14	21.0	1,120	B.
October	23	18	20.8	1,280	B.
November	21	21	21.0	1,250	B.
December	27	21	24.8	1,520	B.

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SANTA YNEZ RIVER BASIN.

SANTA YNEZ RIVER NEAR SANTA BARBARA, CAL.

Location.—One-fourth mile below Gibraltar dam site, in the NE. ¼ NE. ¼ sec. 15, T. 5 N., R. 27 W., about 7 miles north of Santa Barbara. Mono Creek enters 3½ miles below the station.

Records available.—November 1, 1903, to April 30, 1907; October 1, 1907, to January 31, 1908; and February 6, 1910, to December 31, 1911. The station was maintained about 5 miles above the present location from November 21, 1902, to June 20, 1903.

Drainage area.—207 square miles.

Gage.—Staff in three sections about 900 feet below north portal of the Santa Barbara water-supply tunnel. On April 13, 1911, gage datum was lowered 5.00 feet. All gage heights for 1911 are referred to the new datum.

Channel.—Sand and gravel; shifts greatly at extreme high stages; relatively permanent at low stages.

Discharge measurements.—Made from car and cable at gage and by wading at low water.

Accuracy.—The flood in March, 1911, greatly changed the channel, and hence no reliable estimates can be made for the period February 6, 1910, to March 14, 1911. Frequent measurements were secured during 1911, and results are good.

Cooperation.—Maintained in cooperation with Santa Barbara Water Commission.

Discharge measurements of Santa Ynez River near Santa Barbara, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 27	C. M. Watts	6.50	514
31	do	6.20	361
Apr. 13	do	5.72	229
24	do	5.48	155
29	do	5.40	148
May 5	do	5.29	108
10	do	5.20	105
20	do	5.10	85
30	do	5.00	62
June 5	do	4.96	55
11	do	4.91	49
29	do	4.80	27
July 2	do	4.75	27
6	do	4.75	22
13	do	4.70	19
20	do	4.66	15
24	do	4.65	13
28	do	4.60	10
Aug. 3	do	4.56	8.3
11	do	4.60	8.5
21	do	4.55	5.0
29	do	4.52	5.0
31	do	4.50	4.9
Sept. 6	F. C. Ebert	4.50	4.9
6	C. M. Watts	4.50	4.7
20	do	4.50	4.7
Oct. 2	do	4.52	4.9
14	do	4.53	5.4
21	do	4.52	6.0
31	do	4.66	8.3
Nov. 11	do	4.68	8.9
20	do	4.80	10
Dec. 1	do	4.80	10
11	do	4.85	13
21	do	4.83	13

NOTE.—All measurements were made by wading at south end of narrows about 2,000 feet above gage. Beginning with measurement made June 29, inflow from the north portal of tunnel and a small creek between measuring section and gage were estimated (closely) and added to the measured amount. The estimate varied from 0.5 to 1.05 second-feet.

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Daily gage height, in feet, of Santa Ynez River near Santa Barbara, Cal., for 1911.

[C. M. Watts, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.21	8.55	8.45	6.18	5.37	5.00	4.77	4.57	.....	4.52	4.65	4.80
2	6.21	7.90	8.85	6.15	.....	.....	4.76	4.56	.....	4.52	4.65	4.80
3	6.21	8.35	9.95	6.13	5.32	4.99	.....	4.56	4.50	4.52	.....	4.80
4	6.21	9.75	10.10	.....	5.31	4.98	.....	.....	4.50	4.52	4.65	.....
5	6.21	9.00	10.65	6.07	5.29	4.96	4.75	.....	4.50	4.52	4.65	4.82
6	6.21	8.70	10.85	6.04	5.27	4.96	4.75	4.58	4.50	4.53	4.65	4.95
7	6.21	8.20	11.55	5.98	5.25	4.95	4.73	4.58	4.50	4.53	4.65	4.85
8	6.21	8.10	14.10	5.90	5.25	4.94	4.72	4.58	4.50	4.53	4.65	4.85
9	6.35	8.10	20.00	5.86	5.22	4.93	4.72	4.59	4.50	.....	4.65	4.85
10	8.10	8.00	12.45	5.82	5.20	4.92	4.72	4.59	4.50	.....	4.65	4.85
11	6.80	8.40	10.40	5.79	5.20	4.91	4.71	4.60	4.51	4.53	4.68	4.85
12	6.65	8.20	9.10	5.77	5.19	.....	4.71	4.60	4.51	4.53	4.73	4.83
13	6.87	8.00	8.90	5.72	5.19	4.89	4.70	4.57	4.51	4.53	4.77	4.83
14	6.90	8.20	.....	5.70	5.17	4.88	4.70	4.57	4.51	4.53	4.78	4.82
15	7.80	8.00	7.80	5.67	5.16	4.88	4.69	4.57	4.51	4.53	4.79	4.82
16	7.07	7.85	7.65	5.65	5.15	4.89	4.67	4.56	4.51	4.53	4.79	4.82
17	.....	7.80	7.55	5.62	5.14	4.88	.....	4.56	4.50	4.53	4.79	4.83
18	6.76	7.75	7.50	5.59	5.12	4.87	4.67	4.56	.....	4.52	4.79	4.83
19	6.69	7.70	7.40	5.57	5.11	4.85	4.66	4.56	4.50	4.52	4.79	4.83
20	6.62	7.73	7.28	5.53	5.10	4.84	4.66	4.55	4.50	4.52	4.80	4.83
21	6.58	7.64	7.30	5.51	5.09	4.84	4.66	4.55	4.50	4.52	4.80	4.83
22	6.55	7.60	7.00	5.50	5.06	4.83	4.65	4.53	4.50	4.52	.....	4.83
23	6.52	7.52	6.80	5.49	5.06	4.83	4.65	4.53	4.50	.....	4.80	4.83
24	6.82	7.47	6.70	5.48	5.04	4.83	4.65	4.53	4.50	4.52	4.80	4.83
25	8.00	7.41	6.62	5.46	5.04	4.82	4.64	4.52	4.50	4.52	4.81	.....
26	7.48	7.38	6.53	5.44	5.04	4.81	4.62	4.53	4.50	4.54	4.81	.....
27	7.18	7.42	6.50	5.45	5.03	4.81	4.61	4.53	4.50	4.60	4.81	4.83
28	8.55	7.68	6.43	5.41	5.01	4.81	4.60	4.52	4.51	4.62	4.81	4.83
29	12.30	.....	6.35	5.40	5.01	4.80	4.60	4.52	4.51	4.65	4.80	4.84
30	10.80	.....	6.27	5.38	5.00	4.78	4.59	4.51	4.52	4.65	4.80	4.83
31	10.50	.....	6.20	.....	5.00	.....	4.59	4.50	.....	4.66	.....	4.83

Daily discharge, in second-feet, of Santa Ynez River near Santa Barbara, Cal., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	377	137	62	27	8	4	5	8	12
2	.....	366	132	61	26	7	4	5	8	12
3	.....	360	126	60	25	7	4	5	8	12
4	.....	350	123	59	25	7	4	5	8	12
5	.....	339	119	56	24	8	4	5	8	13
6	.....	329	115	56	24	8	4	6	8	18
7	.....	309	110	54	22	8	4	6	8	14
8	.....	283	110	52	21	8	4	6	8	14
9	.....	271	104	51	21	8	4	6	8	14
10	.....	258	100	49	21	8	4	6	8	14
11	.....	249	100	48	19	9	4	6	9	14
12	.....	243	98	46	19	9	4	6	10	13
13	.....	229	98	44	18	8	4	6	11	13
14	.....	223	94	43	18	8	4	6	11	13
15	1,350	215	92	43	17	8	4	6	12	13
16	1,230	209	90	44	15	7	4	6	12	13
17	1,160	201	88	43	15	7	4	6	12	13
18	1,120	192	84	42	15	7	4	5	12	13
19	1,050	187	82	38	14	7	4	5	12	13
20	966	177	80	37	14	6	4	5	12	13
21	980	172	78	37	14	6	4	5	12	13
22	780	169	73	36	14	6	4	5	12	13
23	655	166	73	36	14	6	4	5	12	13
24	600	164	69	36	14	6	4	5	12	13
25	560	159	69	34	13	5	4	5	12	13
26	515	154	69	32	11	6	4	6	12	13
27	500	156	67	32	10	6	4	7	12	13
28	471	146	64	32	9	5	4	7	12	13
29	439	144	64	31	9	5	4	8	12	14
30	409	139	62	28	8	4	5	8	12	13
31	384	.....	62	.....	8	4	.....	8	.....	13

NOTE.—Daily discharge obtained from two rating curves applicable Mar. 15 to Oct. 26 and Oct. 27 to Dec. 31. The first curve is well defined below 600 second-feet and the second is fairly well defined.

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Monthly discharge of Santa Ynez River near Santa Barbara, Cal., for 1911.

[Drainage area, 207 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
March 15–31	1,350	384	775	3.74	2.36	26,100	B.
April	377	139	231	1.12	1.25	13,700	A.
May	137	62	91.4	.442	.51	5,620	A.
June	62	28	44.1	.213	.24	2,620	B.
July	27	8	16.9	.082	.09	1,040	B.
August	9	4	6.8	.033	.04	418	C.
September	5	4	4.0	.019	.02	238	D.
October	8	5	5.8	.028	.03	357	C.
November	12	8	10.4	.050	.06	619	C.
December	18	12	13.2	.064	.07	812	C.
The period						51,500	

SANTA YNEZ RIVER NEAR LOMPOC, CAL.

Location.—At the highway bridge near east boundary of La Misión Vieja de la Purísima grant, about 1½ miles east of Lompoc.

Records available.—November 10, 1906, to January 9, 1907, and September 25, 1907, to December 31, 1911.

Drainage area.—725 square miles.

Gage.—Vertical staff fastened to pier of bridge.

Channel.—Shifting sand.

Discharge measurements.—Made from bridge at gage and by wading.

Diversions.—Water is not diverted above the station, but water for irrigation is pumped from wells along the banks of the river.

Accuracy.—Discharge for 1911 computed from rating tables, covering short periods, and by indirect method for shifting channels. Results are approximate.

Cooperation.—Gage height record furnished by Santa Barbara Water Commission, through L. M. Hyde, engineer.

Discharge measurements of Santa Ynez River near Lompoc, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 27	W. V. Hardy	4.85	548
Mar. 2	Donald McDonald	6.50	4,930
22	....do	2.80	1,870
Apr. 11	....do	2.90	765
May 10	....do	3.00	389
June 7	....do	3.00	243
July 11	....do	2.90	127
Aug. 19	....do	2.75	55
Sept. 8	....do	2.70	47
8[a]	F. C. Ebert	2.70	48
Oct. 11	Donald McDonald	2.70	37
Nov. 13	....do	2.72	45
Dec. 7	....do	2.80	67

[a] Made by wading 300 feet below gage.

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Daily gage height, in feet, of Santa Ynez River near Lompoc, Cal., for 1911.

[D. McDonald, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.7	5.6	6.45	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7
2	3.7	5.0	6.6	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7
3	3.7	4.6	5.6	2.9	3.1	3.0	2.9	2.85	2.7	2.7	2.7	2.7
4	3.7	6.5	6.9	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7
5	3.7	5.8	7.05	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7
6	3.7	5.5	7.05	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7
7	3.7	5.1	9.65	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.8
8	3.7	4.9	9.05	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.8
9	3.7	4.9	9.95	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.8
10	3.9	4.9	7.0	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.8
11	4.4	5.3	5.0	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.8
12	4.3	5.2	4.2	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.8
13	4.3	5.0	3.4	2.9	3.0	3.0	2.9	2.8	2.7	2.7	2.7	2.8
14	4.3	5.2	3.2	2.9	3.0	3.0	2.9	2.8	2.7	2.7	2.7	2.8
15	4.4	5.0	3.2	2.9	3.0	3.0	2.9	2.8	2.7	2.7	2.7	2.8
16	4.5	4.9	2.9	2.9	3.0	3.0	2.9	2.8	2.7	2.7	2.7	2.8
17	4.2	4.8	2.7	3.0	3.0	3.0	2.9	2.75	2.7	2.7	2.7	2.8
18	4.0	4.8	2.7	3.0	3.0	3.0	2.9	2.75	2.7	2.7	2.7	2.8
19	3.9	4.8	2.8	3.0	3.0	3.0	2.85	2.75	2.7	2.7	2.7	2.8
20	3.9	4.9	2.8	3.0	3.0	2.9	2.85	2.75	2.7	2.7	2.7	2.8
21	3.9	4.9	2.8	3.0	3.0	2.9	2.85	2.75	2.7	2.7	2.7	2.8
22	3.9	4.9	2.8	3.0	3.0	2.9	2.85	2.75	2.7	2.7	2.7	2.8
23	3.8	4.9	2.7	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7	2.8
24	3.8	4.9	2.9	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7	2.8
25	4.5	4.9	2.8	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7	2.8
26	4.8	4.8	2.7	3.1	3.0	2.9	2.85	2.7	2.7	2.7	2.7	2.8
27	4.5	4.8	2.8	3.0	3.0	2.9	2.85	2.7	2.7	.....	2.7	2.8
28	4.7	5.0	2.7	.....	3.0	2.9	2.85	2.7	2.7	2.7	2.7	2.8
29	9.3	.....	2.7	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7	2.8
30	6.0	.....	2.7	3.0	3.0	2.9	2.85	2.7	2.7	2.7	2.7	2.8
31	7.05	.....	2.8	.....	3.0	.....	2.85	2.7	.....	2.7	.....	2.8

NOTE.—Feb. 2 to 3 gage height estimated.

Daily discharge, in second-feet, of Santa Ynez River near Lompoc, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	30	2,070	4,750	1,400	520	274	127	97	45	40	37	37
2	30	790	5,290	1,340	500	269	127	97	45	40	37	37
3	30	230	2,070	1,270	590	264	127	97	46	40	37	37
4	30	4,930	6,430	1,210	470	258	127	97	46	39	37	37
5	30	2,610	7,030	1,150	460	253	127	97	47	39	37	37
6	30	1,830	7,030	1,090	440	248	127	97	47	39	37	37
7	30	970	19,000	1,020	430	243	127	97	48	38	37	67
8	30	620	16,100	960	420	243	127	97	48	38	37	67
9	30	620	20,400	900	400	243	127	97	48	38	37	67
10	64	620	15,000	830	389	243	127	97	47	37	37	67
11	335	1,380	9,000	765	384	243	127	97	47	37	37	67
12	260	1,170	6,000	745	379	243	127	97	47	37	37	67
13	260	790	3,800	725	373	243	127	67	46	37	37	67
14	260	1,170	3,300	700	368	243	127	67	46	37	37	67
15	335	790	3,200	680	363	243	127	67	46	37	37	67
16	430	620	2,500	660	358	243	127	67	45	37	37	67
17	195	470	2,000	820	353	243	127	55	45	37	37	67
18	97	470	1,900	800	347	243	127	55	45	37	37	67
19	64	470	2,100	770	342	243	97	55	44	37	37	67
20	64	620	2,000	750	337	127	97	56	44	37	37	67
21	64	620	1,900	730	332	127	97	56	44	37	37	67
22	64	620	1,870	710	327	127	97	57	43	37	37	67
23	42	620	1,600	690	321	127	97	40	43	37	37	67
24	42	620	1,900	660	316	127	97	40	43	37	37	67
25	430	620	1,630	640	311	127	97	41	42	37	37	67
26	810	470	1,370	800	305	127	97	41	42	37	37	67
27	430	470	1,500	600	300	127	97	42	42	37	37	67
28	670	790	1,270	580	295	127	97	42	41	37	37	67
29	17,300	.....	1,210	550	290	127	97	43	41	37	37	67
30	3,210	.....	1,150	530	284	127	97	44	41	37	37	67
31	7,030	.....	1,270	.....	279	.....	97	44	.....	37	.....	67

NOTE.—Daily discharge determined from three rating curves applicable as follows: June 9, 1910, to Jan. 29, 1911, not well defined; Jan. 30 to Mar. 9, 1911, not well defined; June 7 to Aug. 16, also Oct. 11 to Dec. 31, 1911, well defined. Indirect method for shifting channels used Mar. 10 to June 6 and Aug. 17 to Oct. 10, except that for the first period, Mar. 10-22, the assumption was made that the channel scour all occurred Mar. 9.

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Monthly discharge of Santa Ynez River near Lompoc, Cal., for 1911.

[Drainage area, 725 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	17,300	30	1,060	1.46	1.68	65,200	C.
February	4,930	230	1,060	1.38	1.44	55,500	B.
March	20,400	1,150	5,020	6.92	7.98	309,000	C.
April	1,400	530	836	1.15	1.28	49,700	D.
May	590	279	374	.516	.59	23,000	D.
June	274	127	204	.281	.31	12,100	B.
July	127	97	114	.157	.18	7,010	B.
August	97	40	68.1	.095	.11	4,250	C.
September	48	41	44.8	.062	.07	2,670	D.
October	40	37	37.6	.052	.06	2,310	D.
November	37	37	37.0	.051	.06	2,200	D.
December	67	37	61.2	.084	.10	3,760	D.
The year	20,400	30	741	1.02	13.86	537,000	

SALINAS RIVER BASIN.

ARROYO SECO NEAR SOLEDAD, CAL.

Location.—At Pettitt's ranch in sec. 21, T. 19 S., R. 6. E., about 15 miles south of Soledad.

Records available.—January 1, 1901 to December 31, 1911.

Drainage area.—215 square miles.

Gage.—Staff in two sections on right bank.

Channel.—Gravel and fairly permanent.

Discharge measurements.—Made from car and cable 300 feet below gage and by wading about one-fourth mile above cable at low stages.

Accuracy.—Frequent discharge measurements are secured. They plot a little scattering on the rating curve but results are considered reliable. The March flood scoured out the channel and a new rating curve was used after March 7.

Discharge measurements of Arroyo Seco near Soledad, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.	Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 11	Charles Pettitt	5.80	94	July 21	Charles Pettitt	3.88	28
15	do	8.50	1,630	31[a]	do	3.78	20
22	do	6.30	250	Aug. 17[a]	do	3.75	13
30	do	11.60	4,390	25	do	4.12	58
Feb. 14	do	7.12	704	27[a]	do	3.68	11
Mar. 1	do	7.06	656	Sept. 13[a]	F. C. Ebert	3.60	12
13	do	8.05	1,890	13[a]	Charles Pettitt	3.60	13
24	do	6.20	665	24[a]	do	3.75	13
Apr. 2	do	5.55	422	Oct. 8[a]	do	3.75	9.3
17	do	5.10	265	20[a]	do	3.73	15
30	do	4.80	206	Nov. 5[a]	do	3.80	19
May 14	do	4.58	148	19[a]	do	3.86	26
28	do	4.40	107	Dec. 3[a]	do	3.86	23
June 10	do	4.25	79	17	do	3.95	30
July 9	do	3.95	35	31	do	4.05	42

[a] Made by wading about ¼ mile above cable. All other measurements were made from cable.

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Daily gage height, in feet, of Arroyo Seco near Soledad, Cal., for 1911.

[Mrs. Chas. Pettitt, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.39	9.40	7.05	5.59	4.80	4.36	4.05	3.75	3.64	3.75	3.80	3.86
2	5.39	8.50	7.10	5.55	4.78	4.35	4.04	3.72	3.63	3.76	3.80	3.86
3	5.39	8.25	11.50	5.50	4.76	4.34	4.03	3.75	3.63	3.78	3.80	3.86
4	5.39	7.90	9.60	5.40	4.75	4.33	4.01	3.78	3.63	3.78	3.80	3.89
5	5.39	7.60	11.40	5.52	4.75	4.30	4.00	3.78	3.65	3.78	3.80	3.89
6	5.39	7.40	15.90	5.70	4.73	4.28	3.98	3.78	3.65	3.78	3.80	3.95
7	5.39	7.15	18.30	5.52	4.71	4.28	3.98	3.77	3.65	3.76	3.80	3.99
8	5.39	7.00	13.20	5.50	4.69	4.26	3.97	3.77	3.65	3.75	3.80	4.00
9	5.61	6.90	10.50	5.40	4.67	4.26	3.95	3.75	3.65	3.75	3.80	4.00
10	6.30	6.80	9.60	5.35	4.65	4.25	3.94	3.75	3.65	3.75	3.82	3.98
11	5.80	7.25	8.60	5.32	4.63	4.23	3.93	3.75	3.63	3.76	4.00	3.97
12	8.85	6.95	8.40	5.25	4.62	4.22	3.91	3.75	3.63	3.76	3.95	3.95
13	11.20	7.20	8.05	5.22	4.60	4.22	3.91	3.75	3.62	3.78	3.90	3.95
14	11.85	7.15	7.80	5.20	4.58	4.22	3.90	3.73	3.61	3.75	3.89	3.92
15	8.80	7.00	7.60	5.15	4.57	4.22	3.90	3.72	3.63	3.75	3.89	3.92
16	7.50	6.90	7.41	5.10	4.56	4.22	3.90	3.71	3.65	3.75	3.88	3.91
17	6.60	6.85	7.25	5.10	4.55	4.20	3.90	3.70	3.65	3.75	3.87	3.95
18	6.50	6.70	7.00	5.05	4.52	4.20	3.89	3.70	3.65	3.74	3.86	3.95
19	6.45	6.65	6.90	5.01	4.50	4.18	3.89	3.70	3.63	3.74	3.86	3.95
20	6.35	6.60	6.80	5.00	4.48	4.16	3.89	3.69	3.63	3.73	3.86	3.94
21	6.41	6.50	6.60	5.00	4.46	4.15	3.88	3.68	3.63	3.73	3.86	3.94
22	6.30	6.48	6.40	4.98	4.45	4.15	3.88	3.67	3.70	3.73	3.86	3.94
23	6.20	6.45	6.30	4.92	4.43	4.13	3.86	3.67	3.70	3.74	3.86	3.94
24	7.70	6.42	6.20	4.90	4.42	4.13	3.85	3.67	3.75	3.75	3.86	3.94
25	7.68	6.40	6.05	4.89	4.41	4.12	3.83	3.68	3.75	3.75	3.86	3.92
26	7.30	6.33	6.00	4.86	4.40	4.11	3.81	3.68	3.75	3.75	3.86	3.92
27	7.30	6.35	5.90	4.85	4.39	4.10	3.80	3.68	3.74	3.75	3.86	3.92
28	7.78	6.42	5.80	4.85	4.40	4.10	3.80	3.67	3.74	3.75	3.86	4.03
29	12.75	.....	5.75	4.83	4.41	4.08	3.80	3.65	3.76	3.76	3.86	4.20
30	11.60	.....	5.72	4.80	4.39	4.05	3.79	3.65	3.75	3.78	3.86	4.09
31	11.00	.....	5.65	.....	4.38	.....	3.78	3.65	.....	3.78	.....	4.05

Daily discharge, in second-feet, of Arroyo Seco near Soledad, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	26	2,360	662	446	196	98	46	16	12	16	18	23
2	26	1,620	685	432	191	96	45	15	12	16	18	23
3	26	1,420	4,460	415	186	95	44	16	12	17	18	23
4	26	1,180	2,530	380	184	93	40	17	12	17	18	26
5	26	985	4,350	422	184	87	39	17	12	17	18	26
6	26	860	10,000	490	178	84	37	17	12	17	18	33
7	26	712	13,300	422	174	84	37	17	12	16	18	38
8	26	635	6,970	415	169	80	35	17	12	16	18	39
9	64	580	3,980	380	164	80	33	16	12	16	18	39
10	300	530	3,120	362	160	78	32	16	12	16	20	37
11	113	770	2,280	352	155	75	31	16	12	16	39	35
12	1,900	608	2,120	329	153	73	28	16	12	16	33	33
13	4,130	740	1,860	319	148	73	28	16	12	17	27	33
14	4,850	712	1,670	313	144	73	27	15	11	16	26	29
15	1,860	635	1,530	298	141	73	27	15	12	16	26	29
16	920	580	1,400	282	139	73	27	14	12	16	25	28
17	430	555	1,290	282	137	70	27	14	12	16	24	33
18	385	480	1,130	267	130	70	26	14	12	16	23	33
19	364	455	1,070	255	126	67	26	14	12	16	23	33
20	321	430	1,010	252	122	64	26	14	12	15	23	32
21	346	385	900	252	118	62	25	13	12	15	23	32
22	300	376	795	246	116	62	25	13	14	15	23	32
23	258	364	745	229	112	59	23	13	14	16	23	32
24	1,050	351	700	223	110	59	22	13	16	16	23	32
25	1,040	342	632	220	108	57	21	13	16	16	23	29
26	800	313	610	212	106	56	19	13	16	16	23	29
27	800	321	570	210	104	54	18	13	16	16	23	29
28	1,100	351	530	210	106	54	18	13	16	16	23	44
29	5,910	.....	510	204	108	51	18	12	16	16	23	70
30	4,570	.....	498	196	104	46	18	12	16	17	23	52
31	3,920	.....	470	.....	102	.....	17	12	.....	17	.....	46

NOTE.—Daily discharge determined from two fairly well-defined curves, applicable Jan. 1, 1910, to Mar. 7, 1911, and Mar. 8 to Dec. 31, 1911.

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Monthly discharge of Arroyo Seco near Soledad, Cal., for 1911.

[Drainage area, 215 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	5,910	26	1,160	5.40	6.23	71,300	B.
February	2,360	313	702	3.27	3.40	39,000	B.
March	13,300	470	2,330	10.8	12.45	143,000	B.
April	490	196	310	1.44	1.61	18,400	B.
May	196	102	141	.656	.76	8,670	B.
June	98	46	71.5	.333	.37	4,250	B.
July	46	17	28.5	.133	.15	1,750	B.
August	17	12	14.6	.068	.08	898	C.
September	16	11	13.0	.060	.07	774	C.
October	17	15	16.1	.075	.09	990	C.
November	39	18	22.7	.106	.12	1,350	B.
December	70	23	33.9	.158	.18	2,080	B.
The year	13,300	11	405	1.88	25.51	292,000	

PAJARO RIVER BASIN.

PAJARO RIVER AT WATSONVILLE, CAL.

Location.—At highway bridge at Watsonville, about 10 miles below mouth of San Benito River, and 5 miles above the mouth of Pajaro River.

Records available.—September 14 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on first pier from right end of bridge.

Channel.—Shifting sand.

Discharge measurements.—Made from bridge or by wading.

Diversions.—Amount of diversions above the station not known.

Accuracy.—Results fair.

Discharge measurements of Pajaro River at Watsonville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 14[a]	F. C. Ebert	2.22	9.8
Oct. 19[b]	....do	2.20	12
19[b]	Lasley Lee	2.20	12

[a] Made by wading under bridge at gage. [b] Made by wading 600 feet above gage.

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Daily gage height, in feet, and discharge, in second-feet, of Pajaro River at Watsonville, Cal., for 1911.

[W. Poehlmann, observer.]

Day.	September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.28	17	2.42	34	2.45	38
2			2.35	25	2.42	34	2.46	40
3			2.30	19	2.40	31	2.46	40
4			2.28	17	2.40	31	2.48	43
5			2.28	17	2.40	31	2.42	34
6			2.28	17	2.40	31	2.45	38
7			2.25	15	2.40	31	2.42	34
8			2.30	19	2.42	34	2.42	34
9			2.14	8	2.42	34	2.40	31
10			2.16	9	2.48	43	2.40	31
11			2.20	11	2.50	46	2.42	34
12			2.28	17	2.48	43	2.45	38
13			2.30	19	2.45	38	2.42	34
14	2.22	13	2.32	21	2.40	31	2.40	31
15	2.25	15	2.30	19	2.38	29	2.42	34
16	2.22	13	2.32	21	2.28	17	2.45	38
17	2.22	13	2.30	19	2.44	37	2.50	46
18	2.22	13	2.30	19	2.45	38	2.45	38
19	2.24	14	2.28	17	2.44	37	2.45	38
20	2.25	15	2.28	17	2.38	29	2.42	34
21	2.25	15	2.28	17	2.38	29	2.40	31
22	2.28	17	2.26	16	2.40	31	2.42	34
23	2.28	17	2.28	17	2.40	31	2.40	31
24	2.28	17	2.32	21	2.40	31	2.40	31
25	2.29	18	2.35	25	2.40	31	2.40	31
26	2.30	19	2.45	38	2.42	34	2.40	31
27	2.30	19	2.30	19	2.45	38	2.42	34
28	2.25	15	2.32	21	2.45	38	2.45	38
29	2.30	19	2.36	26	2.45	38	2.50	46
30	2.28	17	2.40	31	2.45	38	2.52	49
31			2.40	31			2.52	49

NOTE.—Daily discharge determined from a poorly defined rating curve.

Monthly discharge of Pajaro River at Watsonville, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
September 14–30	19	13	15.8	533	C.
October	38	8	19.5	1,200	C.
November	46	17	33.9	2,020	C.
December	49	31	36.5	2,240	C.

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SAN FRANCISCO BAY DRAINAGE BASINS.

SAN JOAQUIN RIVER BASIN.

SAN JOAQUIN RIVER NEAR FRIANT,[1] CAL.

Location.—At Fort Miller ranch, in the SE. ¼ sec. 34, T. 10 S., R. 21 E., about 4 miles above Friant.

Records available.—October 18, 1907, to December 31, 1910.

Drainage area.—1,640 square miles.

Gage.—Staff in two sections on left bank.

Channel.—Sand and gravel, and shifts slightly.

Discharge measurements.—Made from car and cable 25 feet below gage.

Diversion and storage.—Some storage and power developed above the station. The Fresno Flume & Irrigation Co. diverts about 10 second-feet from Stevenson Creek. This water is used for irrigation near Clovis.

Accuracy.—Results good.

Discharge measurements of San Joaquin River near Friant, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 21	J. E. Stewart	5.35	2,130
May 15	....do	8.56	7,390
25	H. J. Tompkins	9.65	10,800
June 7	....do	10.90	12,100
11	W. V. Hardy	12.70	18,600
15	....do	12.90	19,000
Sept. 14	J. E. Stewart	3.82	625

Daily gage height, in feet, of San Joaquin River near Friant, Cal., for 1911.

[E. G. Davis, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.48	11.60	4.90	8.80	8.22	8.65	10.85	6.20	4.34	4.70	3.60	3.60
2	3.40	9.40	5.50	8.90	8.50	9.40	9.80	6.10	4.30	4.10	3.60	3.65
3	3.32	8.10	5.40	9.00	8.80	10.00	10.20	5.95	4.25	3.90	3.60	3.60
4	3.48	9.14	9.25	8.50	9.60	11.20	10.30	5.80	4.20	3.80	3.60	3.60
5	3.48	8.60	7.50	8.80	10.50	11.50	11.00	5.70	4.18	3.80	3.58	3.60
6	3.48	7.12	6.70	10.40	9.25	12.00	11.20	5.73	4.10	3.80	3.55	3.60
7	3.48	6.70	6.46	8.75	8.85	11.40	13.00	5.70	4.05	3.90	3.55	3.60
8	3.48	6.34	12.80	8.20	9.10	11.40	11.26	5.60	4.00	3.80	3.55	3.70
9	3.48	6.04	8.76	8.30	9.30	11.60	11.20	5.50	3.98	3.90	3.55	3.65
10	7.00	5.80	11.12	8.20	9.10	12.00	10.00	5.40	3.95	3.80	4.10	3.55
11	4.51	5.65	8.60	7.70	9.20	12.90	9.00	5.30	3.91	3.75	3.65	3.55
12	4.05	6.32	7.67	7.40	9.50	13.08	9.95	5.24	3.90	3.75	3.58	3.50
13	4.15	6.75	7.20	7.20	9.20	14.00	10.50	5.10	3.90	3.72	3.65	3.50
14	4.68	6.22	7.00	7.00	9.35	13.25	10.60	5.00	3.85	3.68	3.70	3.50
15	4.86	5.80	6.80	7.00	8.60	12.90	10.50	5.00	3.80	3.65	3.70	3.50
16	4.70	5.38	6.60	7.20	8.15	13.55	10.60	4.92	3.80	3.60	3.70	3.50
17	4.25	5.40	6.80	7.40	8.20	13.45	10.60	4.90	3.80	3.63	3.70	3.50
18	4.16	5.21	6.85	8.40	9.00	13.20	11.00	4.97	3.80	3.60	3.70	3.50
19	4.15	5.18	6.85	8.40	9.40	13.20	10.00	4.92	3.76	3.60	3.70	3.50
20	4.08	5.12	6.80	8.35	9.90	13.10	9.40	4.87	3.75	3.60	3.66	3.50
21	4.20	5.36	6.85	8.50	10.40	13.00	8.90	4.85	3.75	3.60	3.70	3.50
22	5.00	5.08	6.65	9.00	12.00	12.10	8.10	4.75	3.75	3.60	3.85	3.50
23	4.55	5.02	7.00	9.45	11.50	11.45	7.70	4.65	4.50	3.58	4.00	3.50
24	4.70	5.08	7.15	9.50	10.55	10.35	8.10	4.55	4.30	3.60	3.85	3.50
25	10.05	4.98	7.10	9.68	9.45	9.70	7.60	4.50	4.10	3.60	3.65	3.45
26	6.90	4.90	7.15	9.75	9.80	10.50	7.70	4.50	4.00	3.60	3.60	3.45
27	5.40	4.90	7.25	9.20	9.80	11.50	7.33	4.45	3.90	3.60	3.60	3.45
28	5.00	4.90	7.44	8.50	9.60	11.50	6.70	4.40	3.70	3.55	3.50	3.52
29	8.70	.....	7.70	8.10	9.47	11.20	6.55	4.40	3.70	3.60	3.55	3.57
30	16.10	.....	8.10	8.10	9.35	10.85	6.50	4.35	.....	3.62	3.55	3.52
31	18.00	.....	8.40	.....	9.00	.....	6.40	4.35	.....	3.60	.....	3.66

[1] Known formerly as Pollasky.

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Daily discharge, in second-feet, of San Joaquin River near Friant, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	393	15,000	1,640	7,740	6,570	7,420	12,800	3,240	1,070	1,430	470	470
2	345	9,070	2,330	7,950	7,120	9,070	10,000	3,100	1,040	855	470	505
3	297	6,340	2,210	8,160	7,740	10,500	11,100	2,900	990	690	470	470
4	393	8,470	8,720	7,120	9,550	13,800	11,300	2,700	945	615	470	470
5	393	7,320	5,240	7,740	11,900	14,700	13,300	2,570	927	615	457	470
6	393	4,610	3,950	11,600	8,720	16,200	13,800	2,610	855	615	438	470
7	393	3,950	3,600	7,640	7,840	14,400	19,500	2,570	812	690	438	470
8	393	3,440	18,800	6,530	8,380	14,400	14,000	2,450	770	615	438	540
9	393	3,020	7,660	6,720	8,830	15,000	13,800	2,330	754	690	438	505
10	4,420	2,700	13,600	6,530	8,380	16,200	10,500	2,210	730	615	855	438
11	1,240	2,510	7,320	5,600	8,600	19,200	8,160	2,090	698	578	505	438
12	812	3,410	5,550	5,070	9,310	19,800	10,400	2,020	690	578	457	405
13	900	4,020	4,740	4,740	8,600	23,100	11,900	1,860	690	555	505	405
14	1,410	3,270	4,420	4,420	8,950	20,400	12,100	1,740	652	526	540	405
15	1,600	2,700	4,100	4,420	7,320	19,200	11,900	1,740	615	505	540	405
16	1,430	2,190	3,800	4,740	6,440	21,500	12,100	1,660	615	470	540	405
17	990	2,210	4,100	5,070	6,530	21,100	12,100	1,640	615	491	540	405
18	909	1,980	4,180	6,920	8,160	20,200	13,300	1,710	615	470	540	405
19	900	1,950	4,180	6,920	9,070	20,200	10,500	1,660	585	470	540	405
20	838	1,880	4,100	6,820	10,300	19,900	9,070	1,610	578	470	505	405
21	945	2,160	4,180	7,120	11,600	19,500	7,950	1,590	578	470	540	405
22	1,740	1,830	3,880	8,160	16,200	16,500	6,340	1,480	578	470	652	405
23	1,280	1,770	4,420	9,190	14,700	14,600	5,600	1,380	1,230	457	770	405
24	1,430	1,830	4,660	9,310	12,000	11,500	6,340	1,280	1,040	470	652	405
25	10,700	1,720	4,580	9,740	9,190	9,790	5,420	1,230	855	470	505	375
26	4,260	1,640	4,660	9,910	10,000	11,900	5,600	1,230	770	470	470	375
27	2,210	1,640	4,820	8,600	10,000	14,700	4,950	1,180	690	470	470	375
28	1,740	1,640	5,140	7,120	9,550	14,700	3,950	1,130	540	438	405	418
29	7,530	.....	5,600	6,340	9,240	13,800	3,730	1,130	540	470	438	450
30	31,100	.....	6,340	6,340	8,950	12,800	3,660	1,080	855	484	438	418
31	38,800	.....	6,920	.....	8,160	.....	3,520	1,080	.....	470	.....	512

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge Sept. 30 estimated.

Monthly discharge of San Joaquin River near Friant, Cal., for 1911.

[Drainage area, 1,640 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	38,800	297	3,890	2.37	2.73	239,000	A.
February	15,000	1,640	3,720	2.27	2.36	207,000	A.
March	18,800	1,640	5,470	3.34	3.85	336,000	A.
April	11,600	4,420	7,140	4.35	4.85	425,000	A.
May	16,200	6,440	9,290	5.66	6.52	571,000	A.
June	23,100	7,420	15,900	9.70	10.82	946,000	A.
July	19,500	3,520	9,640	5.88	6.78	593,000	A.
August	3,240	1,080	1,880	1.15	1.33	116,000	A.
September	1,230	540	764	.466	.52	45,500	B.
October	1,430	438	570	.348	.40	35,000	B.
November	855	405	517	.315	.35	30,800	B.
December	540	375	433	.264	.30	26,600	B.
The year	38,800	297	4,930	3.00	40.81	3,570,000	

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TULARE LAKE IN KINGS COUNTY CAL.

Tulare Lake is about 30 miles directly south of Fresno and 40 miles northwest of Bakersfield. The lake is roughly rectangular in shape and its greatest length is from northwest to southeast. In November, 1907, when its margin was carefully determined, the lake had an area of about 274 square miles, a maximum depth of 12.4 feet, an average length of 20 miles, and a width of 13.5 miles; the water's edge was 3 miles from the town of Corcoran, and the water surface about 12 feet below. The lake surface reached its greatest height in the summer of 1907, when it had a maximum depth of nearly 14 feet. Since July, 1907, it has been gradually subsiding.

The lake bed resembles a flat saucer. The flat, level area in the bottom has an elevation of approximately 180 feet above mean sea level and covers about 55 square miles. The lowest point on the crest of the delta ridge to the north is about 27 feet higher than the bottom of the lake. Natural overflow will not occur, therefore, until the lake has a maximum depth of nearly 30 feet and an area of nearly 1,000 square miles.

During 1906 and a part of 1907 a record of the stage of the lake was kept by means of a Government staff gage located near the entrance of Kings River near Lemoore, Cal., at the middle of sec. 4, T. 21 S., R. 20 E., M. D. B. and M. The zero of the gage was at an elevation of 175.1 feet above mean sea level, or 4 feet below the bottom of the lake (elevation 179.1 feet). On May 11, 1907, a staff gage was set near Corcoran, Cal., referred to the same datum and used until July 30, 1909.

On July 28, 1910, a vertical staff gage, in two sections, was installed on the section line just south of the corner to secs. 27, 28, 33, and 34, T. 20 S., R. 20 E., about 10 miles south of Lemoore near Stratford post office. The datum on this gage is 171.0 feet above sea level.

All published gage records have been reduced to show the actual depth of the water on the lowest point of the lake bed.

Daily gage height, in feet, of Tulare Lake near Stratford, Cal., for 1911.

[Mrs. J. E. Sanderson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.37					10.90						
2		9.55	9.90	10.65				11.68				
3									11.10			
4	9.37						11.60			10.55	10.27	
5		9.85	10.50									10.10
6				10.70	10.80	10.90		11.65				
7							11.70			10.55	10.27	
8	9.39								11.00			
9		9.87	10.30									10.10
10				10.90	10.80	10.89	11.75	11.65		10.25		

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Daily gage height, in feet, of Tulare Lake near Stratford, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11										10.50		
12	9.39	10.10										10.10
13												
14						11.25	11.75	11.50	10.80		10.20	
15			10.50	10.80						10.40		
16	9.35	9.70			10.75							10.05
17			10.52				11.75		10.75			
18						11.35				10.37	10.15	
19			10.55					11.45				
20	9.35											10.00
21		10.00		10.85	10.77		11.75			10.35		
22						11.35		11.35	10.70		10.10	
23			10.55									
24										10.35		9.90
25	9.35						11.73					
26		9.90				11.50		11.30	10.60		10.10	
27			10.50	10.85	10.77							
28										10.30		10.00
29	9.37					11.50	11.70				10.10	
30				10.80				11.20	10.57			
31										10.30		10.00

KERN RIVER AT ISABELLA, CAL.

Location.—At highway bridge in the SW. ¼ sec. 17, T. 26 S., R. 3 E., half a mile north of Isabella, 6 miles below Cowell Creek and half a mile above South Fork of Kern River.

Records available.—October 5, 1910, to December 31, 1911.

Drainage area.—1220 square miles.

Gage.—Vertical staff fastened to large cottonwood tree on left bank, 100 feet below bridge.

Channel.—Gravel and small bowlders and farily permanent.

Discharge measurements.—Made from birdge above gage and by wading.

Diversions.—The intake of the Kern River Power Co.'s canal, which diverts water around the station, is 3½ miles above the station. In addition there are several small diversions for irrigation above the station.

Accuracy.—Results are good.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of Kern River at Isabella, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 7	H. J. Tompkins	1.55	133
Mar. 3	....do	.80	10
Apr. 28	....do	3.75	1,430
May 4	....do	4.15	1,620
5	....do	4.48	1,860
June 23	....do	5.28	2,840
27	....do	5.50	3,150
Sept. 11[a]	....do	.80	8.1
Nov. 17[b]	....do	.80	8.0

[a] By wading 1,200 feet below gage.

[b] Made by wading ½ mile below gage.

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Daily gage height, in feet, of Kern River at Isabella, Cal., for 1911.

[Chas. T. Shook, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.7	1.9	0.9	.....	3.5	3.9	6.0	2.3	0.9	.....	.....	.....
2	.7	.....	.....	3.4	3.6	.....	.....	2.3	.9	.....	0.8	0.6
3	.....	.....	.9	.....	3.8	.....	5.8	2.2	.....	.....	.....	.....
4	.....	1.8	.....	3.4	4.1	.....	4.8	2.1	.9	.....	.....	.....
5	.....	1.8	.....	.....	4.5	4.9	5.0	2.0	.9	0.9	.8	.....
6	.....	1.6	.....	3.7	.....	5.0	4.8	.....	.9	.9	.....	.....
7	.....	1.6	.....	.....	.....	5.0	5.0	1.8	.9	.9	.8	.....
8	.....	1.5	1.25	.....	.....	4.7	4.9	1.5	.9	.8	.....	.....
9	.7	1.2	1.9	3.7	.....	.....	.....	1.9	.9	.9	.....	.....
10	.....	.....	3.3	.....	4.3	.....	4.8	1.7	.....	.9	.8	.9
11	.....	.....	2.4	.....	4.1	.....	4.4	1.8	.8	.....	.....	.....
12	.....	1.0	.....	.....	4.1	.....	4.2	1.6	.8	.....	.9	.....
13	.....	.....	.....	.....	4.3	.....	4.0	.....	.8	.....	.....	.....
14	.....	.9	.....	.....	4.2	.....	4.7	1.5	.....	.....	.9	.....
15	.....	.....	.....	.....	3.8	.....	4.5	1.4	.8	.9	.....	.....
16	.....	.9	.....	.....	.....	.....	.....	1.2	.8	.....	.....	.....
17	.....	.9	.....	3.8	.....	.....	4.9	1.1	.....	.....	.8	.....
18	.8	.9	.....	.....	.....	.....	4.7	1.0	.8	.....	.....	.8
19	.9	.9	.....	.....	.....	.....	4.7	.9	.....	.....	1.0	.....
20	.....	.....	.....	.....	.....	.....	4.2	.....	.....	.....	.....	.....
21	.....	.9	1.8	.....	4.6	.....	3.8	.9	.....	.....	.....	.....
22	1.2	.....	.....	.....	5.4	.....	3.4	.9	.....	.....	1.0	.....
23	.....	.....	.....	.....	5.2	5.3	.....	.9	.....	.....	.....	.....
24	.....	.9	.....	3.8	5.1	4.8	3.5	.9	.....	.....	.9	.....
25	.....	.....	.....	.....	5.0	.....	3.0	.9	.8	.....	.....	.....
26	.....	.....	2.7	4.0	4.4	4.8	2.9	.9	.8	1.0	.9	.....
27	.....	.9	2.8	.....	4.2	5.25	2.8	.....	.9	1.0	.9	.....
28	.9	.....	.....	3.8	.....	5.4	2.7	.9	.....	1.1	.....	.....
29	4.1	.....	2.8	3.6	.....	.....	2.6	.9	.....	.....	.9	.....
30	3.7	.....	.....	3.6	.....	.....	.....	.9	.....	.....	.9	.....
31	6.8	.....	.....	.....	3.9	.....	2.5	.9	.....	.....	.....	.....

Daily discharge, in second-feet, of Kern River at Isabella, Cal., for 1910–11.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1910.				1910.				1910.			
1	4	8	6	11	5	8	4	21	27	8	4
2	4	8	6	12	7	8	4	22	27	8	4
3	4	8	6	13	8	8	4	23	274	8	4
4	4	8	6	14	8	8	4	24	27	8	4
5	4	8	5	15	18	8	4	25	27	8	4
6	4	8	5	16	18	8	4	26	27	8	4
7	4	8	5	17	18	8	4	27	27	7	4
8	4	8	5	18	18	8	4	28	8	7	4
9	4	8	4	19	27	8	4	29	8	7	4
10	4	8	4	20	27	8	4	30	8	7	4
								31	8	.....	4

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Daily discharge, in second-feet, of Kern River at Isabella, Cal., for 1910–11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	4	238	17	900	1,100	1,410	3,860	391	17	40	12	10
2	4	227	17	1,020	1,170	1,500	3,720	391	17	30	8	2
3	4	216	17	1,020	1,330	1,800	3,570	351	17	30	8	17
4	4	205	30	1,020	1,580	2,150	2,280	312	17	20	8	17
5	4	205	60	1,140	1,960	2,390	2,500	274	17	17	8	17
6	4	144	80	1,250	2,200	2,500	2,280	240	17	17	8	17
7	4	144	90	1,250	2,200	2,500	2,500	205	17	17	8	17
8	4	117	64	1,250	2,200	2,170	2,390	117	17	8	8	17
9	4	55	238	1,250	2,000	2,000	2,340	238	17	17	8	17
10	4	46	950	1,260	1,760	2,500	2,280	174	12	17	8	17
11	5	36	433	1,270	1,580	3,000	1,860	205	8	17	12	17
12	5	27	300	1,280	1,580	3,500	1,670	144	8	17	17	17
13	6	22	230	1,290	1,760	3,380	1,500	130	8	17	17	17
14	6	17	170	1,300	1,670	3,300	2,170	117	8	17	17	12
15	7	17	120	1,310	1,330	3,200	1,960	93	8	17	14	8
16	7	17	100	1,320	1,240	3,380	2,180	55	8	17	11	8
17	8	17	110	1,330	1,150	3,500	2,390	40	8	17	8	8
18	8	17	120	1,330	1,230	3,430	2,170	27	8	17	18	8
19	17	17	140	1,330	1,400	3,370	2,170	17	8	17	27	8
20	17	17	160	1,330	1,650	3,300	1,670	17	8	17	27	8
21	17	17	205	1,330	2,060	3,180	1,330	17	8	27	27	8
22	55	17	260	1,330	3,000	3,050	1,020	17	8	27	27	17
23	50	17	340	1,330	2,740	2,870	1,060	17	8	27	22	17
24	45	17	440	1,330	2,620	2,280	1,100	17	8	27	17	17
25	35	17	510	1,420	2,500	2,280	750	17	8	27	17	17
26	30	17	574	1,500	1,860	2,280	686	17	8	27	17	17
27	25	17	628	1,550	1,670	2,800	628	17	17	27	17	27
28	17	17	628	1,330	1,570	3,000	574	17	17	40	17	27
29	1,580	.....	628	1,170	1,490	3,200	524	17	30	27	17	27
30	1,250	.....	700	1,170	1,440	3,500	500	17	50	17	17	27
31	5,170	.....	800	.....	1,410	.....	477	17	.....	17	.....	27

NOTE.—Daily discharge determined from a rating curve well defined below 4,000 second-feet. Discharge interpolated for days on which gage was not read except Oct. 1–4 and 24 to 27, 1910; Jan. 20–21, Mar. 4–7, 12–20, 22–25, Mar. 30 to Apr. 1, Apr. 27, May 6–9, 16–20, 28–30, June 2–4, 9–22, 29–30, Sept. 28 to Oct. 4, Oct. 29–31, Dec. 3–9, and 19 to 31, discharge for which was estimated from the discharge at Bakersfield. Estimated values only approximate.

Monthly discharge of Kern River at Isabella, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
October	274	4	21.4	1,320	C.
November	8	7	7.9	470	C.
December	6	4	4.4	271	D.
1911.					
January	5,170	4	271	16,700	C.
February	238	17	69.2	3,840	B.
March	950	17	295	18,100	B.
April	1,550	900	1,260	75,000	B.
May	3,000	1,100	1,760	108,000	B.
June	3,500	1,410	2,760	164,000	B.
July	3,860	477	1,810	111,000	A.
August	391	17	120	7,380	B.
September	50	8	13.6	809	C.
October	40	8	21.7	1,330	C.
November	27	8	14.9	887	C.
December	27	2	15.7	965	D.
The year	5,170	2	703	508,000	

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Combined daily discharge, in second-feet, of Kern River and power canal at Isabella, Cal., for 1910–11.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1910.				1910.				1910.			
1	260	286	224	11	222	261	295	21	358	256	286
2	262	276	234	12	255	256	351	22	349	255	280
3	262	261	240	13	296	255	307	23	274	255	279
4	259	291	318	14	291	265	284	24	290	266	280
5	260	296	308	15	306	265	269	25	315	256	282
6	255	286	271	16	359	261	267	26	310	251	260
7	227	271	283	17	344	261	277	27	308	246	251
8	225	266	290	18	368	255	259	28	286	243	254
9	221	261	274	19	372	256	261	29	281	230	254
10	221	259	278	20	367	255	279	30	274	234	254
								31	268	.....	254

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	254	811	442	1,490	1,690	2,000	4,450	980	452	513	324	292
2	249	667	446	1,610	1,760	2,090	4,310	980	447	445	315	285
3	246	789	470	1,610	1,920	2,390	4,160	940	442	422	316	297
4	254	778	512	1,610	2,170	2,740	2,870	901	436	400	307	300
5	257	778	568	1,730	2,550	2,980	3,090	863	423	381	310	298
6	254	717	578	1,840	2,790	3,090	2,870	829	414	375	309	291
7	254	717	573	1,840	2,790	3,090	3,090	794	405	373	306	321
8	247	690	609	1,840	2,790	2,760	2,980	706	397	351	297	296
9	251	628	828	1,840	2,590	2,590	2,930	827	386	354	301	282
10	330	614	1,540	1,850	2,350	3,090	2,870	763	375	351	291	287
11	424	587	1,020	1,860	2,170	3,590	2,450	794	368	350	392	289
12	308	572	889	1,870	2,170	4,090	2,260	733	363	347	355	283
13	318	523	819	1,880	2,350	3,970	2,090	719	357	342	312	279
14	313	590	759	1,890	2,260	3,890	2,760	706	349	338	338	269
15	300	527	709	1,900	1,920	3,790	2,550	682	343	334	333	270
16	300	504	689	1,910	1,830	3,970	2,770	644	336	326	342	275
17	289	460	699	1,920	1,740	4,090	2,980	629	333	321	334	279
18	285	493	709	1,920	1,820	4,020	2,760	616	329	319	330	281
19	298	479	729	1,920	1,990	3,960	2,760	606	324	317	339	268
20	294	493	749	1,920	2,240	3,890	2,260	596	320	317	339	263
21	314	471	794	1,920	2,650	3,770	1,920	592	318	326	336	294
22	537	448	849	1,920	3,590	3,640	1,610	565	320	327	334	264
23	456	447	929	1,920	3,330	3,460	1,650	554	372	326	324	273
24	411	455	1,030	1,920	3,210	2,870	1,690	539	363	326	306	306
25	598	448	1,100	2,010	3,090	2,870	1,340	523	349	324	310	277
26	592	447	1,160	2,090	2,450	2,870	1,280	513	339	322	312	245
27	538	453	1,220	2,140	2,260	3,390	1,220	504	340	323	310	253
28	438	460	1,220	1,920	2,160	3,590	1,160	597	327	343	306	286
29	2,140	.....	1,220	1,760	2,080	3,790	1,110	486	372	342	306	308
30	1,820	.....	1,290	1,760	2,030	4,090	1,090	473	605	333	302	280
31	5,750	.....	1,390	.....	2,000	.....	1,070	461	.....	335	.....	254

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Combined monthly discharge of Kern River and power canal at Isabella, Cal., for 1910–11.

[Drainage area, 1,220 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
October	372	221	289	0.237	0.27	17,800	A.
November	296	230	261	.214	.24	15,500	A.
December	351	224	274	.225	.26	16,800	A.
1911.							
January	5,750	246	623	.511	.59	38,800	B.
February	811	447	573	.470	.49	31,800	A.
March	1,540	442	856	.702	.81	52,600	A.
April	2,140	1,490	1,850	1.52	1.70	110,000	B.
May	3,590	1,690	2,350	1.93	2.22	144,000	B.
June	4,090	2,000	3,350	2.75	3.07	199,000	B.
July	4,450	1,070	2,400	1.97	2.27	148,000	A.
August	980	461	681	.558	.64	41,900	A.
September	605	318	377	.309	.34	22,400	A.
October	513	317	352	.289	.33	21,600	A.
November	392	291	321	.263	.29	19,100	A.
December	321	245	282	.231	.27	17,300	A.
The year	5,750	245	1,170	.959	13.02	846,000	

KERN RIVER POWER CO.'S CANAL NEAR KERNVILLE, CAL.

Location.—At Beattie ranch, 1,000 feet below intake, and about three-fourths of a mile below Kernville.

Records available.—January 1, 1910 to December 31, 1911.

Gage.—Automatic gage on left bank at short flume. A vertical staff is located just below flume in concrete lined section of canal.

Discharge measurements.—Made in flume at automatic gage.

Accuracy.—Results are considered excellent.

Cooperation.—Daily discharge records furnished by Kern River Power Co., through G. O. Newman, chief engineer.

This canal diverts from Kern River about half a mile below Kernville. Its total length is about 10 miles and it is concrete lined except where flume is required. The power house is located in the canyon at Borel, where the water is returned to the river. The power is transmitted to Los Angeles.

Discharge measurements of Kern River Power Co.'s canal near Kernville, Cal., in 1910–11.

Date.	Hydrographer.	Gage height.	Discharge.
1910.		*Feet.*	*Sec.-ft.*
Oct. 5	J. E. Stewart	4.18	229
Nov. 21	Tompkins and Garlock	4.38	252
1911.			
Feb. 7	H. J. Tompkins	8.10	554
Mar. 3	.....do	7.00	448
Apr. 29	.....do	8.50	587
Sept. 14	.....do	5.95	338
Nov. 17	.....do	5.70	322

NOTE.—These measurements were made from plank bridge over flume. Gage heights referred to various gages installed and used by the United States Geological Survey.

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Daily discharge, in second-feet, of Kern River Power Co.'s canal near Kernville, Cal., for 1910–11.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	580	580	592	592	592	592	582	511	298	256	278	218
2	580	580	592	592	592	592	582	488	286	258	268	228
3	580	555	592	592	592	592	582	467	282	258	253	234
4	580	580	592	592	592	592	582	447	297	255	283	312
5	580	555	592	592	592	592	582	408	301	256	288	303
6	511	548	341	592	592	592	567	433	275	251	278	266
7	580	540	592	592	592	592	550	414	268	223	263	278
8	580	550	592	592	592	592	565	404	263	221	258	275
9	580	548	592	592	592	592	582	389	258	217	253	270
10	580	545	592	592	592	592	582	380	255	217	251	274
11	580	545	592	592	592	592	582	370	253	217	253	291
12	580	560	592	592	592	592	582	363	249	248	248	347
13	580	558	592	592	592	592	582	355	246	288	247	303
14	580	555	592	592	592	580	582	348	248	283	257	280
15	453	564	592	592	592	582	574	345	278	288	257	265
16	433	574	592	592	592	582	569	335	380	341	253	263
17	433	574	592	592	592	582	540	326	453	326	253	273
18	433	574	592	592	592	582	582	322	394	350	247	255
19	433	580	592	592	592	582	582	318	355	345	248	257
20	433	586	592	592	592	582	574	314	331	340	247	275
21	433	592	592	592	592	582	582	312	312	331	248	282
22	579	592	592	592	592	582	582	312	297	322	247	276
23	580	592	592	592	592	582	582	321	287	0	247	275
24	580	592	592	592	592	582	582	331	278	263	258	276
25	580	592	592	592	592	582	574	346	272	288	248	278
26	580	592	592	592	592	582	569	336	268	283	243	256
27	580	592	592	592	592	582	560	326	265	281	239	247
28	580	592	592	592	592	582	582	317	261	278	236	250
29	580	.....	592	592	592	582	582	312	267	273	223	250
30	580	.....	592	592	592	582	560	305	255	266	227	250
31	580	.....	592	.....	592	.....	555	299	.....	260	.....	250
1911.												
1	250	573	425	589	589	589	589	589	435	473	312	282
2	245	440	429	589	589	589	589	589	430	415	307	283
3	242	573	453	589	589	589	589	589	425	392	306	280
4	250	573	482	589	589	589	589	589	419	380	299	283
5	253	573	508	589	589	589	589	589	406	364	302	281
6	250	573	498	589	589	589	589	589	397	358	301	274
7	250	573	483	589	589	589	589	589	388	356	298	304
8	243	573	545	589	589	589	589	589	380	343	289	279
9	247	573	590	589	589	589	589	589	369	337	293	265
10	326	568	589	589	589	589	589	589	363	334	283	270
11	419	551	589	589	589	589	589	589	360	333	380	272
12	303	545	589	589	589	589	589	589	355	330	338	266
13	312	501	589	589	589	589	589	589	349	325	295	262
14	307	573	589	589	589	589	589	589	341	321	321	257
15	293	510	589	589	589	589	589	589	335	317	319	262
16	293	487	589	589	589	589	589	589	328	309	331	267
17	281	443	589	589	589	589	589	589	325	304	326	271
18	277	476	589	589	589	589	589	589	321	302	312	273
19	281	462	589	589	589	589	589	589	316	300	312	260
20	277	476	589	589	589	589	589	579	312	300	312	255
21	297	454	589	589	589	589	589	575	310	299	309	286
22	482	431	589	589	589	589	589	548	312	300	307	247
23	406	430	589	589	589	589	589	537	364	299	302	256
24	366	438	589	589	589	589	589	522	355	299	289	289
25	563	431	589	589	589	589	589	506	341	297	293	260
26	562	430	589	589	589	589	589	496	331	295	295	228
27	513	436	589	589	589	589	589	487	323	296	293	226
28	421	443	589	589	589	589	589	480	310	303	289	259
29	565	.....	589	589	589	589	589	469	342	315	289	281
30	573	.....	589	589	589	589	589	456	555	316	285	253
31	582	.....	589	.....	589	.....	589	444	.....	318	.....	227

NOTE.—Discharge interpolated Jan. 1–3, 23, Feb. 6, 13, 15, 19, 20, Oct. 30, Dec. 24, 28–31, 1910. Oct. 23, 1910, water turned out of canal; discharge estimated 0 second-feet. Discharge interpolated Feb. 27, Mar. 11, Aug. 16, Sept. 12, Oct. 30, Nov. 12 and 19, 1911. Daily discharge record except as noted furnished by the Kern River Power Co. Interpolations and estimates made by engineers of United States Geological Survey.

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Monthly discharge of Kern River Power Co.'s canal near Kernville, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
January	580	433	545	33,560
February	592	540	571	31,700
March	592	341	584	35,900
April	592	592	592	35,200
May	592	592	592	36,400
June	592	580	586	34,900
July	582	540	575	35,400
August	511	299	363	22,300
September	453	246	291	17,300
October	350	0	267	16,400
November	288	223	253	15,100
December	347	218	270	16,600
The year	592	0	457	331,000
1911				
January	582	242	353	21,700
February	573	430	504	28,000
March	590	425	560	34,400
April	589	589	589	35,000
May	589	589	589	36,200
June	589	589	589	35,000
July	589	589	589	36,200
August	589	444	558	34,300
September	555	310	363	21,600
October	473	295	320	19,700
November	380	283	306	18,200
December	304	226	266	16,400
The year	590	226	465	337,000

NOTE.—Monthly values computed by United States Geological Survey.

KERN RIVER NEAR BAKERSFIELD, CAL.[1]

Location.—At mouth of lower canyon, in sec. 2, T. 29 S., R. 28 E., 5 miles northeast of Bakersfield.

Records available.—January 1, 1894, to June 30, 1907, and March 1, 1908, to December 31, 1911.

Drainage area.—2,345 square miles.

Gage.—Automatic water-stage register at footbridge.

Discharge measurements.—Made from footbridge at gage.

Diversions.—Several small diversions on main river and South Fork for irrigation. Diversions at and below Kernville for power are returned above the station.

Accuracy.—Results are good.

Cooperation.—Daily discharge furnished by Kern County Land Co. through A. K. Warren, engineer.

[1] This station known formerly as at "first point of measurement."

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Daily discharge, in second-feet, of Kern River near Bakersfield, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	318	3,437	593	2,240	2,481	2,607	3,210	1,200	492	600	366	366
2	294	1,906	599	2,398	2,543	2,588	3,004	1,192	487	573	354	341
3	281	1,489	601	2,397	2,603	2,603	3,122	1,151	474	530	376	335
4	288	1,381	657	2,420	2,830	2,842	3,270	1,076	477	495	365	334
5	286	1,415	718	2,474	3,095	3,179	3,203	1,021	482	456	369	361
6	286	1,205	724	2,883	3,253	3,466	3,232	988	471	437	381	351
7	289	1,063	719	2,530	3,164	3,815	3,126	959	445	429	381	363
8	289	1,003	737	2,350	3,224	3,518	3,202	922	444	418	388	364
9	294	952	1,353	2,235	3,287	3,419	3,177	900	445	412	369	365
10	321	905	2,263	2,194	3,086	3,519	3,010	873	440	410	364	363
11	477	874	2,099	2,072	2,937	3,924	2,912	851	437	414	382	350
12	504	813	1,599	1,988	2,907	4,287	2,620	832	428	393	398	345
13	398	765	1,406	1,841	2,921	4,555	2,572	787	410	393	393	335
14	391	818	1,258	1,769	2,972	4,551	2,667	726	392	396	392	330
15	376	806	1,162	1,703	2,906	4,355	2,780	682	393	398	401	340
16	403	729	1,126	1,685	2,678	4,230	2,884	654	383	389	393	346
17	415	688	1,144	1,743	2,598	4,496	2,876	634	378	389	386	366
18	391	683	1,236	1,819	2,597	4,623	2,963	619	386	381	380	381
19	385	699	1,266	1,985	2,690	4,562	2,951	603	390	365	368	367
20	375	702	1,298	2,263	2,878	4,396	2,874	593	383	368	367	360
21	393	673	1,346	2,326	3,136	4,198	2,536	599	370	368	365	366
22	579	629	1,403	2,366	3,368	4,098	2,245	601	371	372	362	360
23	625	618	1,451	2,494	3,623	3,742	2,092	581	391	378	351	334
24	545	598	1,543	2,693	3,814	3,505	2,021	543	424	398	333	362
25	657	589	1,585	2,792	3,672	3,219	1,887	526	421	399	321	372
26	905	569	1,607	2,943	3,377	3,179	1,688	525	398	384	326	327
27	728	574	1,653	3,044	3,075	3,487	1,530	518	415	374	348	301
28	630	593	1,670	2,880	2,938	3,752	1,431	508	426	371	327	341
29	703	.....	1,724	2,651	2,911	3,726	1,347	495	424	368	296	385
30	2,786	.....	1,851	2,515	2,783	3,525	1,262	484	441	374	336	389
31	3,667	.....	2,029	.....	2,712	.....	1,208	488	.....	384	.....	346

Monthly discharge of Kern River near Bakersfield, Cal., for 1911.

[Drainage area, 2,345 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	3,667	281	622	0.265	0.31	38,200
February	3,437	569	971	.414	.43	53,900
March	2,263	593	1,300	.554	.64	79,900
April	3,044	1,685	2,320	.989	1.10	138,000
May	3,814	2,481	3,000	1.28	1.48	184,000
June	4,623	2,588	3,730	1.59	1.77	222,000
July	3,270	1,208	2,550	1.09	1.26	157,000
August	1,200	484	746	.318	.37	45,900
September	492	370	424	.181	.20	25,200
October	600	365	413	.176	.20	25,400
November	401	296	365	.156	.17	21,700
December	389	301	352	.150	.17	21,600
The year	4,623	281	1,400	.597	8.10	1,010,000

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SOUTH FORK OF KERN RIVER NEAR ONYX, CAL.

Location.—Three-fourths of a mile north of the Kernville-Walker Pass Road, on the Rankin ranch, in the NE. ¼ SW. ¼ sec. 24, T. 25 S., R. 35 E., about 5 miles northeast of Onyx.

Records available.—September 12 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff on left bank 200 feet below intake of lower Rankin ditch. Installed November 16, 1911, at about the same location and with same datum as temporary gage previously used.

Channel.—Sand and fine gravel; fairly permanent.

Discharge measurements.—Made from car and cable 60 feet below gage and by wading.

Diversions.—Three small irrigation ditches head above the station.

Discharge measurements of South Fork of Kern River near Onyx, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 12[a]	H. J. Tompkins	1.85	34
Nov. 16[b]	....do	1.85	63

[a] Made by wading one-fourth mile above gage. Powers ditch was diverting 2.7 second-feet.
[b] Made by wading 100 feet below new inclined gage installed this date. Powers ditch was diverting 1.1 second-feet. (Powers ditch diverts from South Fork of Kern River above the gage.)

Daily gage height, in feet, of South Fork of Kern River near Onyx, Cal., for 1911.

[Laurence Rankin, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	2.00	1.75	1.80	16	1.85	1.71	1.81	1.85
2	.....	1.92	1.75	1.80	17	1.73	1.70	1.78	1.85
3	.....	1.87	1.73	1.88	18	1.73	1.70	1.79	1.85
4	.....	1.84	1.73	1.88	19	1.72	1.70	1.80	1.85
5	.....	1.83	1.71	1.88	20	1.72	1.70	1.80	1.85
6	.....	1.83	1.71	1.88	21	1.69	1.70	1.80	1.85
7	.....	1.82	1.71	1.88	22	1.74	1.70	1.80	1.85
8	.....	1.71	1.71	1.80	23	1.75	1.70	1.80	1.85
9	.....	1.71	1.71	1.80	24	1.73	1.70	1.80	1.88
10	.....	1.71	1.71	1.80	25	1.72	1.70	1.80	1.90
11	.....	1.70	1.71	1.85	26	1.72	1.70	1.85	1.90
12	1.85	1.70	1.60	1.87	27	1.70	1.70	1.90	1.90
13	1.85	1.70	1.60	1.87	28	1.60	1.78	1.90	1.90
14	1.81	1.70	1.60	1.87	29	2.10	1.80	1.87	1.90
15	1.79	1.72	1.70	1.85	30	2.90	1.80	1.78	1.85
					31	.....	1.80	.....	1.85

SOUTH FORK OF KERN RIVER AT ISABELLA, CAL.

Location.—At highway bridge at Isabella, in the NW. ¼ sec. 20, T. 26 S., R. 33 E., half a mile above junction with Kern River.

Records available.—October 5, 1910 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to middle bent of bridge.

Channel.—Sand and somewhat shifting.

Discharge measurements.—Made from bridge at gage and by wading.

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Diversions.—Twenty-eight irrigation ditches, varying in capacity from 8 to 20 second-feet, head above the station.

Accuracy.—On account of shifting channel and lack of high water measurements discharge withheld for 1911.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of South Fork of Kern River at Isabella, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 6	H. J. Tompkins	1.30	262
Mar. 3	do	.80	121
Apr. 28	do	2.40	702
May 2[a]	do	2.15	647
June 24[b]	do	1.70	[d] 192
Sept. 14	do	.35	13
Nov. 17[c]	do	.45	21

[a] Made from upstream side of bridge.
[b] Made by wading below bridge.
[c] Made by wading 3 feet below gage.
[d] Discharge in two channels, 157 and 35 sec.-feet, respectively.

Daily gage height, in feet, of South Fork of Kern River at Isabella, Cal., for 1911.

[C. T. Shook and Roy Oldfield, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.6	0.9	.....	2.1	1.7	1.3	0.8	.....	0.7	.....	0.5
2	.....	.....	.....	1.9	2.15	.....	1.3	.9	.....	.7	0.5	.5
3	.....	.....	.8	1.9	2.15	.....	1.3	.9	.....	.7	.5	.6
4	.....	1.5	.....	.....	2.2	.....	1.2	.9	.....	.....	.4	.6
5	.....	1.5	.....	2.0	2.4	1.7	1.2	.....	.....	.6	.5	.6
6	.....	1.3	.....	2.1	.....	1.7	.....	.....	.....	.6	.4	.6
7	.....	1.0	.....	.....	.....	1.8	.....	.....	.....	.6	.4	.6
8	.....	1.0	1.0	.....	.....	1.95	.....	.....	.....	.....	.....	.6
9	3.0	0.9	2.05	.....	.....	.....	.....	.....	.....	.6	.4	.6
10	.....	.9	2.25	1.9	2.3	.....	.....	.....	.....	.6	.4	.6
11	.....	.....	1.8	1.9	2.2	.....	.....	.....	.....	.....	.....	.....
12	.....	.....	.9	.....	2.3	.....	.....	.....	.....	.5	.....	.....
13	.....	.9	.....	.....	2.3	.....	1.0	.....	.....	.5	.5	.....
14	.....	.9	.....	.....	2.2	.....	1.0	.4	0.4	.5	.4	.....
15	.....	.....	.....	.....	2.0	.....	1.0	.4	.4	.5	.4	.....
16	.....	.9	.6	.....	.....	.....	1.0	.4	.4	.5	.4	.....
17	.....	.9	.....	.....	.....	.....	1.0	.....	.....	.5	.5	.....
18	4.0	.....	.....	.....	.....	.....	1.0	.....	.....	.5	.5	.6
19	3.0	.....	.....	.....	.....	.....	1.0	.....	.....	.5	.5	.....
20	.....	.8	.5	.....	2.0	.....	.....	.....	.....	.5	.5	.....
21	.....	.....	1.4	2.1	2.1	.....	.....	.....	.....	.5	.5	.....
22	6.0	.9	2.4	.....	2.1	.....	.....	.....	.....	.5	.5	.....
23	.....	.9	2.5	.....	2.05	1.7	.....	.....	.....	.5	.....	.6
24	.....	.....	2.5	2.3	2.05	1.7	.....	.....	.4	.5	.5	.....
25	.....	.....	.....	.....	2.0	.....	.....	.....	.4	.6	.5	.6
26	.....	.9	1.6	2.4	2.0	.....	.....	.....	.4	.6	.5	.6
27	.....	.9	1.5	.....	1.9	1.6	.....	.....	.4	.6	.....	.....
28	.9	.9	1.5	2.4	.....	1.5	.....	.....	.4	.6	.5	.6
29	1.0	.....	1.5	2.3	.....	.....	.....	.....	.9	.....	.5	.6
30	1.8	.....	.....	2.2	.....	.....	.8	.....	.9	.....	.5	.6
31	2.9	.....	1.7	.....	1.7	.....	.9	.....	.....	.6	.....	.6

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ERSKINE CREEK NEAR ISABELLA, CAL.

Location.—At ford at mouth of canyon, 2¾ miles above junction with Kern River, in the NE. ¼ sec. 9, T. 27 S., R. 33 E., 5 miles south of Isabella.

Records available.—February 7 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to willow tree, about 80 above ford on left bank.

Channel.—Sand and gravel. Two channels at high stages.

Discharge measurements.—Made by wading near the gage.

Diversions.—A small ditch diverts water for irrigation about 9 miles above the station.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements can be made.

Discharge measurements of Erskine Creek near Isabella, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 7	H. J. Tompkins	2.50	8.7
Apr. 29	do	2.60	4.1
June 26	do	2.30	1.3
Sept. 14	do	2.10	.3

NOTE.—These measurements were made by wading at different sections.

Daily gage height, in feet, of Erskine Creek near Isabella, Cal., for 1911.

[C. T. Shook and Roy Oldfield, observers.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1											
2									2.1		2.6
3			2.9							2.3	
4											
5											
6											
7	2.5										
8		2.9		2.5							
9											
10											
11											2.68
12									2.3		
13											
14	2.4							2.1			
15											
16											
17		2.8									
18			2.8								
19											
20											
21											
22											
23										2.3	
24	2.8										
25											
26		3.0	2.7		2.3			2.1			
27											
28										2.4	
29			2.6								
30								2.1			
31											

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BASIN CREEK NEAR HAVALAH, CAL.

Location.—At highway bridge on Caliente-Havalah road at Rankin ranch, in Walkers Basin, about 10 miles southwest of Havalah.
Records available.—February 8 to November 30, 1911.
Drainage area.—36.2 square miles.
Gage.—Vertical staff on left bank at bridge.
Channel.—Sand and gravel; will shift at high water.
Discharge measurements.—Made by wading below bridge.
Diversions.—Rankin ditch diverts above the station.
Accuracy.—Results are fair.
Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of Basin Creek near Havalah, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 8	H. J. Tompkins	0.90	7.3
May 6	.....do	.75	4.4
June 22	.....do	.73	3.9
Sept. 15	.....do	.75	3.8

NOTE.—These measurements were made by wading at various sections.

Daily gage height, in feet, of Basin Creek near Havalah, Cal., for 1911.

[L. P. Allen and W. Rankins, observers.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1								0.8			
2						0.6			0.9	0.9	
3				0.6	0.6						
4								.8			
5						.6	0.65				
6				.75	.6				.9	.9	
7			0.9	.9				.85			
8	0.9										
9					.6	.6	.7		1.0		
10										.9	
11			.9	.6				.8			
12					.6		.75				
13						.6			1.0		
14			.9							.9	
15				.6	.6		.7	.8			
16			.6			.6			.9		
17	.9							.8			
18			.6	.6	.6		.7				
19						.75			.9	.9	
20		0.9						.85			
21			.6	.9	.8		.72				
22					.73	.7					
23			.6					.9	.9	.9	
24	.9				.85		.7				
25				.9		.75					
26								.9	.9		
27			.6		.9					.9	
28				.6		.75	.75				
29									.9		
30		.9	.6		.85			.9		.9	
31				.6		.7	.7				

NOTE.—No record during December, 1911.

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Daily discharge, in second-feet, of Basin Creek near Havalah, Cal., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	7	7	7	2	2	4	3	5	7	7
2	7	7	7	2	2	2	3	5	7	7
3	7	7	7	2	2	2	2	5	7	7
4	7	7	7	3	2	2	2	5	7	7
5	7	7	7	3	2	2	2	5	7	7
6	7	7	7	4	2	2	2	6	7	7
7	7	7	7	7	2	2	2	6	8	7
8	7	7	7	6	2	2	3	6	9	7
9	7	7	7	4	2	2	3	6	10	7
10	7	7	7	3	2	2	3	5	10	7
11	7	7	7	2	2	2	4	5	10	7
12	7	7	7	2	2	2	4	5	10	7
13	7	7	7	2	2	2	4	5	10	7
14	7	7	7	2	2	2	3	5	9	7
15	7	7	4	2	2	2	3	5	8	7
16	7	7	2	2	2	2	3	5	7	7
17	7	7	2	2	2	3	3	5	7	7
18	7	7	2	2	2	3	3	5	7	7
19	7	7	2	4	3	4	3	6	7	7
20	7	7	2	5	4	4	3	6	7	7
21	7	7	2	7	5	3	3	6	7	7
22	7	7	2	7	4	3	3	7	7	7
23	7	7	2	7	5	3	3	7	7	7
24	7	7	2	7	6	4	3	7	7	7
25	7	7	2	7	6	4	3	7	7	7
26	7	7	2	5	7	4	4	7	7	7
27	7	7	2	4	7	4	4	7	7	7
28	7	7	2	2	7	4	4	7	7	7
29	.....	7	2	2	6	4	4	7	7	7
30	.....	7	2	2	6	3	3	7	7	7
31	.....	7	.....	2	.....	3	3	.....	7	.....
Mean	7.0	7.0	4.4	3.6	3.4	2.8	3.1	5.8	7.7	7.0

NOTE.—Daily discharge determined from a fairly-defined rating curve. Discharge interpolated for days on which the gage was not read; interpolated values are only roughly approximate, particularly those from February to June, although an examination of the precipitation records does not indicate that there was any material rise during these months.

Monthly discharge of Basin Creek near Havalah, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
February	7	7	7.0	389
March	7	7	7.0	430
April	7	2	4.4	262
May	7	2	3.6	221
June	7	2	3.4	202
July	4	2	2.8	172
August	4	2	3.1	191
September	7	5	5.8	345
October	10	7	7.7	473
November	7	7	7.0	417
The period	.....	.....	.....	3,100

NOTE.—Discharge only roughly approximate.

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WHITE RIVER NEAR HOT SPRINGS, CAL.

Location.—On Vaughn ranch, 1 mile east of White River and Hot Springs stage road, about 5 miles southwest of Hot Springs.

Records available.—January 18 to December 31, 1911

Drainage area.—Not measured.

Gage.—Vertical staff on right bank fastened to a willow tree about 150 feet above observer's house.

Channel.—Sand and gravel.

Discharge measurements.—Made by wading.

Cooperation.—Gage-height record furnished by David Vaughn. Discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements can be made.

Discharge measurements of White River near Hot Springs, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 18	H. J. Tompkins	1.4	2.0
May 11	.....do	1.6	4.0

Daily gage height, in feet, of White River near Hot Springs, Cal., for 1911.

[David Vaughn, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.9	1.7	.....	1.7	1.5	1.3	.....	.....	1.25	1.2	1.2
2	.....	1.8	1.7	.....	1.7	1.5	1.3	.....	.....	1.25	1.2	1.2
3	.....	1.7	1.8	.....	1.7	1.5	1.3	.....	.....	1.3	1.2	1.2
4	.....	2.0	1.9	.....	1.7	1.5	1.25	.....	.....	1.3	1.2	1.4
5	.....	1.8	1.8	.....	1.7	1.5	1.25	.....	.....	1.3	1.2	1.4
6	.....	1.7	1.8	.....	1.7	1.45	1.25	.....	.....	1.3	1.2	1.3
7	.....	1.7	1.7	.....	1.7	1.45	1.25	.....	.....	1.25	1.2	1.4
8	.....	1.6	2.2	.....	1.7	1.45	1.2	.....	.....	1.25	1.2	1.4
9	.....	1.6	2.2	.....	1.7	1.4	1.2	.....	.....	1.25	1.2	1.3
10	.....	1.6	2.7	.....	1.65	1.4	1.2	.....	.....	1.25	1.7	1.3
11	.....	1.7	2.7	.....	1.6	1.4	1.2	.....	.....	1.25	1.5	1.3
12	.....	1.5	2.3	.....	1.6	1.4	1.2	.....	.....	1.25	1.4	1.3
13	.....	1.95	2.1	.....	1.6	1.4	1.2	.....	.....	1.25	1.4	1.3
14	.....	2.2	2.0	1.8	1.6	1.4	1.2	.....	.....	1.25	1.3	1.25
15	.....	1.9	2.0	1.8	1.6	1.4	1.15	.....	.....	1.25	1.3	1.25
16	.....	1.8	1.9	1.8	1.5	1.4	1.15	.....	.....	1.25	1.3	1.25
17	.....	1.8	1.9	1.8	1.5	1.4	1.2	.....	.....	1.25	1.4	1.5
18	1.4	1.8	1.9	1.8	1.5	1.4	1.18	.....	.....	1.25	1.3	1.45
19	1.4	1.8	1.8	1.8	1.5	1.4	1.2	.....	.....	1.25	1.3	1.45
20	1.4	1.8	1.8	1.75	1.5	1.4	1.2	.....	.....	1.25	1.3	1.4
21	2.1	1.8	2.0	1.7	1.5	1.35	1.2	.....	.....	1.2	1.25	1.4
22	1.7	1.8	2.0	1.7	1.5	1.35	1.15	.....	.....	1.2	1.25	1.4
23	1.6	1.7	1.9	1.7	1.5	1.35	1.15	.....	.....	1.2	1.25	1.3
24	1.95	1.7	2.1	1.7	1.5	1.35	1.15	.....	.....	1.2	1.25	1.3
25	2.0	1.7	2.0	1.7	1.5	1.35	1.15	.....	1.15	1.2	1.25	1.3
26	2.0	1.7	1.9	1.7	1.5	1.3	1.15	.....	1.15	1.2	1.25	1.3
27	1.7	1.8	1.9	1.9	1.5	1.3	1.15	.....	1.15	1.2	1.25	1.3
28	1.8	1.8	.....	1.8	1.5	1.3	1.15	.....	1.2	1.25	1.2	1.4
29	.1	.....	.....	1.8	1.5	1.3	1.1	.....	1.2	1.25	1.2	1.4
30	1.9	.....	.....	1.7	1.5	1.3	.....	.....	1.2	1.25	1.2	1.5
31	2.3	.....	.....	.....	1.5	.....	.....	.....	.....	1.25	.....	1.4

NOTE.—No water in river July 30 to September 24.

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DEER CREEK AT HOT SPRINGS, CAL.

Location.—Below footbridge at forest supervisor's headquarters in the Sequoia National Forest, about half a mile below Hot Springs. Tyler Creek enters about 2½ miles below the station.

Records available.—October 7, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on left bank, 30 feet below footbridge.

Channel.—Sand, gravel, and bowlders.

Discharge measurements.—Made from highway bridge, 100 feet below gage or by wading.

Diversions.—Irrigation ditches head above the station.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are made.

Discharge measurements of Deer Creek at Hot Springs, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 15	H. J. Tompkins	0.55	6.1
Mar. 7	do	.50	7.2
May 13	do	.70	12

NOTE.—Measurements were made by wading.

Daily gage height, in feet, of Deer Creek at Hot Springs, Cal., for 1911.

[A. B. Patterson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.51	0.85	0.58	0.82	0.80	.....	.....	0.30	0.35	0.39	0.41	0.46
2	.....	.....	.....	.80	.80	.....	0.44	.31	.35	.40	.42	.46
3	.....	.65	.68	.78	.80	0.60	.45	.31	.36	.40	.42	.49
4	.....	.80	.70	.77	.81	.59	.45	.31	.37	.40	.42	.50
5	.51	.69	.69	1.06	.81	.59	.44	.31	.37	.39	.41	.52
6	.....	.63	.67	1.05	.80	.60	.43	.35	.37	.39	.42	.60
7	.....	.....	.65	1.00	.80	.59	.43	.34	.37	.39	.42	.57
8	.....	.....	1.35	.90	.80	.58	.42	.33	.36	.40	.42	.52
9	.52	.61	1.12	.88	.80	.....	.42	.35	.33	.41	.42	.51
10	.80	.58	1.30	.88	.....	.....	.42	.35	.35	.42	.62	.51
11	.59	.60	1.00	.87	.70	.....	.41	.35	.35	.42	.50	.51
12	.52	.58	.90	.85	.70	.....	.41	.35	.32	.42	.43	.51
13	.51	.95	.90	.86	.70	.....	.40	.35	.32	.42	.42	.51
14	.51	.83	.82	.82	.70	.....	.40	.36	.31	.43	.43	.51
15	.52	.68	.81	.81	.70	.....	.38	.36	.31	.43	.43	.51
16	.52	.70	.80	.81	.69	.....	.39	.35	.32	.42	.43	.51
17	.....	.68	.79	.81	.69	.....	.39	.36	.34	.42	.43	.51
18	.....	.60	.72	.81	.69	.....	.40	.35	.35	.41	.44	.51
19	.50	.....	.75	.80	.68	.....	.39	.35	.34	.42	.44	.55
20	.64	.60	.75	.80	.67	.....	.....	.35	.34	.42	.45	.57
21	.85	.61	.84	.80	.66	.....	.....	.35	.35	.43	.45	.53
22	.....	.....	.81	.81	.65	.....	.....	.35	.37	.43	.45	.50
23	.....	.....	.79	.80	.64	.....	.....	.36	.36	.43	.46	.50
24	.84	.60	.82	.79	.63	.....	.....	.36	.35	.43	.46	.49
25	.90	.....	.79	.79	.61	.....	.....	.35	.36	.43	.46	.47
26	.80	.....	.78	.80	.61	.....	.....	.36	.37	.43	.46	.45
27	.65	.60	.75	.80	.61	.....	.31	.37	.38	.43	.46	.45
28	1.00	.....	.75	.82	.61	.44	.31	.37	.38	.43	.46	.46
29	.80	.....	.77	.80	.61	.45	.30	.37	.43	.43	.46	.45
30	.....	.....	.78	.80	.61	.45	.31	.37	.39	.42	.46	.50
31	1.20	.....	.78	.....	.61	.....	.31	.36	.....	.42	.....	.53

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TYLER CREEK NEAR HOT SPRINGS, CAL.

Location.—Below foot log at the Thompson ranch, in Sequoia National Forest, about 1½ miles north of Hot Springs and about 4 miles above junction with Deer Creek.

Records available.—January 16 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank 100 feet below observer's house.

Channel.—Bowlders and sand.

Discharge measurements.—Made by wading.

Diversions.—Three small irrigation ditches divert above the station.

Cooperation.—Gage height record furnished by D. B. Thompson. Discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements can be made.

Discharge measurements of Tyler Creek near Hot Springs, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 16	H. J. Tompkins	1.00	4.0
Mar. 7	do	1.10	6.4
May 12	do	1.00	6.9

NOTE.—These measurements were made by wading.

Daily gage height, in feet, of Tyler Creek near Hot Springs, Cal., for 1911.

[D. B. Thompson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.3	1.1	1.2	1.15	1.0	0.8	.....	.....	.....	.....	.....
2	.....	1.15	.....	1.2	1.15	.....	.....	.....	.....	0.6	0.7	.....
3	.....	1.1	.....	1.2	.....	1.0	.....	0.5	0.4	.....	.....	0.5
4	.....	1.2	.....	.....	1.15	.....	.....	.....	.....	.....	.....	.....
5	.....	1.1	1.2	.....	.....	1.0	.7	.....	.....	.....	.....	.....
6	.....	1.1	1.2	1.5	.....	1.0	.....	.5	.....	.....	.....	.....
7	.....	1.2	1.1	.....	1.15	1.0	.....	.....	.....	.....	.7	.5
8	.....	1.1	1.85	.....	.....	1.0	.5	.....	.....	.....	.....	.....
9	.....	1.1	1.7	1.3	.....	1.0	.....	.....	.4	.7	.....	.....
10	.....	1.0	1.75	.....	1.1	1.0	.....	.5	.....	.....	.....	.6
11	.....	1.1	.....	1.3	.....	.....	.....	.....	.....	.....	.....	.....
12	.....	1.05	1.5	.....	1.1	.....	.....	.....	.....	.....	.7	.....
13	.....	1.3	1.5	.....	.....	1.0	.....	.....	.....	.6	.....	.....
14	.....	1.25	.....	1.3	1.1	.....	.....	.....	.....	.....	.....	.6
15	.....	1.2	1.3	.....	.....	.....	.....	.....	.4	.....	.....	.....
16	1.0	1.2	1.3	1.2	1.1	.....	.....	.....	.....	.6	.6	.....
17	.....	1.15	1.3	.....	1.1	.....	.5	.....	.....	.....	.....	.....
18	1.0	1.1	.....	1.2	1.1	.....	.....	.5	.....	.....	.....	.6
19	1.0	1.1	1.3	1.2	1.1	.9	.....	.....	.....	.....	.6	.....
20	1.0	1.1	.....	1.2	.....	.....	.....	.....	.....	.6	.....	.....
21	1.25	1.1	.....	.....	1.1	.....	.....	.....	.5	.....	.....	.....
22	1.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
23	.....	1.1	.....	.....	1.1	.....	.5	.5	.....	.....	.5	.6
24	1.3	1.1	.....	1.15	.....	.9	.....	.....	.....	.....	.....	.....
25	1.4	1.1	1.3	1.15	1.1	.....	.....	.....	.....	.7	.....	.....
26	1.2	1.1	1.3	1.2	.....	.....	.....	.4	.6	.....	.....	.....
27	1.2	.....	1.2	1.2	1.1	.....	.....	.....	.....	.....	.....	.....
28	1.2	1.1	1.2	.....	.....	.....	.....	.....	.....	.....	.....	.7
29	1.55	.....	1.2	.....	1.05	.....	.....	.....	.6	.7	.5	.....
30	1.2	.....	1.2	.....	.....	.....	.5	.4	.....	.....	.....	.....
31	1.45	.....	1.2	.....	.....	.....	.....	.....	.....	.....	.....	.....

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TULE RIVER NEAR PORTERSVILLE, CAL.

Location.—Below highway bridge near the McFarland ranch, in the NW. ¼ NW. ¼ sec. 25, T. 21 S., R. 28 E., about 1 mile above mouth of South Fork and 6 miles east of Portersville. The North and Middle forks of Tule River unite about 9 miles above the station.

Records available.—May 1, 1901, to December 31, 1911.

Drainage area.—266 square miles.

Gage.—Staff in two sections on right bank, 100 feet below bridge; vertical upper section nailed to willow tree; inclined low-water section fastened to posts.

Channel.—Gravel and small bowlders, and is practically permanent.

Discharge measurements.—Made from bridge above gage or by wading.

Diversions.—Several small irrigation ditches divert water above the station.

Accuracy.—Results good.

Discharge measurements of Tule River near Portersville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 21	H. J. Tompkins	2.60	312
June 8	W. V. Hardy	2.39	229

Daily gage height, in feet, of Tule River near Portersville, Cal., for 1911.

[Martha Brough, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.20	5.0	1.85	2.90	2.60	2.40	1.65	1.00	0.83	0.91	1.00	1.15
2	1.20	3.10	1.88	2.95	2.55	2.30	1.60	1.00	.81	.93	1.00	1.15
3	1.20	2.80	2.00	2.90	2.60	2.25	1.55	1.00	.80	.95	1.00	1.15
4	1.20	3.50	2.60	2.95	2.70	2.30	1.50	1.00	.80	.96	1.00	1.15
5	1.20	2.62	2.40	3.60	2.75	2.30	1.45	.99	.81	.97	1.00	1.15
6	1.20	2.50	2.40	3.45	2.78	2.35	1.48	.98	.82	.99	1.00	1.20
7	1.08	2.40	2.50	3.10	2.70	2.40	1.40	.97	.84	1.00	1.00	1.30
8	1.18	2.35	4.90	3.00	2.65	2.40	1.38	.96	.86	1.00	1.00	1.30
9	1.21	2.30	4.00	2.95	2.63	2.40	1.36	.95	.88	1.00	1.00	1.30
10	2.75	2.20	5.10	2.90	2.60	2.35	1.35	.95	.87	1.00	1.80	1.29
11	1.80	2.15	3.90	2.80	2.60	2.30	1.34	.94	.86	1.00	1.60	1.28
12	1.60	2.20	3.40	2.73	2.60	2.28	1.33	.93	.85	.99	1.50	1.27
13	1.52	2.18	3.20	2.68	2.60	2.27	1.32	.93	.84	.98	1.40	1.26
14	1.45	2.90	3.00	2.60	2.60	2.26	1.31	.93	.83	.98	1.30	1.24
15	1.45	2.40	2.85	2.57	2.60	2.25	1.30	.93	.82	.98	1.20	1.22
16	1.45	2.20	2.80	2.60	2.58	2.24	1.30	.92	.80	.98	1.20	1.22
17	1.42	2.15	2.80	2.55	2.58	2.23	1.30	.92	.80	.98	1.20	1.22
18	1.40	2.10	2.81	2.60	2.57	2.20	1.30	.92	.80	.98	1.20	1.22
19	1.38	2.05	2.80	2.60	2.56	2.10	1.29	.91	.81	.98	1.20	1.22
20	1.38	2.00	2.80	2.65	2.55	2.05	1.28	.90	.82	.98	1.20	1.22
21	2.80	2.00	3.05	2.65	2.55	2.00	1.27	.90	.83	.98	1.20	1.22
22	2.10	2.00	2.81	2.65	2.56	1.95	1.25	.90	.84	.98	1.20	1.22
23	1.90	2.00	2.75	2.70	2.57	1.90	1.23	.90	.85	.98	1.20	1.22
24	3.02	1.99	2.80	2.75	2.58	1.88	1.21	.90	.86	.98	1.15	1.22
25	3.65	1.98	2.85	2.80	2.59	1.84	1.20	.90	.87	.98	1.15	1.22
26	2.75	1.96	2.75	2.85	2.60	1.80	1.18	.90	.88	.98	1.15	1.22
27	2.25	1.95	2.74	2.90	2.60	1.78	1.15	.89	.88	.98	1.15	1.25
28	2.10	1.90	2.76	2.75	2.50	1.75	1.12	.88	.89	.98	1.15	1.40
29	4.90	.....	2.80	2.60	2.40	1.70	1.10	.87	.90	.98	1.15	1.38
30	3.92	.....	2.88	2.60	2.40	1.68	1.08	.86	.91	.98	1.15	1.38
31	6.60	.....	2.90	.....	2.40	.....	1.04	.85	.....	.98	.....	1.38

NOTE.—Daily discharge determined from a well-defined rating curve.

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Daily discharge, in second-feet, of Tule River near Portersville, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	43	1,520	128	376	286	236	96	26	16	21	26	38
2	43	445	133	393	273	214	88	26	15	22	26	38
3	43	344	154	376	286	204	82	26	14	23	26	38
4	43	610	286	393	314	214	75	26	14	24	26	38
5	43	292	236	657	329	214	70	25	15	24	26	38
6	43	260	236	588	338	225	73	25	15	25	26	43
7	32	236	260	445	314	236	64	24	16	26	26	53
8	41	225	1,440	410	300	236	62	24	18	26	26	53
9	44	214	865	393	294	236	60	23	19	26	26	53
10	329	193	1,590	376	286	225	58	23	18	26	119	52
11	119	183	810	344	286	214	57	22	18	26	88	51
12	88	193	565	323	286	210	56	22	17	25	75	50
13	78	189	493	308	286	208	55	22	16	25	64	49
14	70	376	410	286	286	206	54	22	16	25	53	47
15	70	236	360	278	286	204	53	22	15	25	43	45
16	70	193	344	286	281	201	53	21	14	25	43	45
17	66	183	344	273	281	199	53	21	14	25	43	45
18	64	173	347	286	278	193	53	21	14	25	43	45
19	62	164	344	286	276	173	52	21	15	25	43	45
20	62	154	344	300	273	164	51	20	15	25	43	45
21	344	154	428	300	273	154	50	20	16	25	43	45
22	173	154	347	300	276	145	48	20	16	25	43	45
23	136	154	329	314	278	136	46	20	17	25	43	45
24	417	152	344	329	281	133	44	20	18	25	38	45
25	682	150	360	344	283	126	43	20	18	25	38	45
26	329	147	329	360	286	119	41	20	19	25	38	45
27	204	145	326	376	286	116	38	19	19	25	38	48
28	173	136	332	329	260	111	36	19	19	25	38	64
29	1,440	.....	344	286	236	103	34	18	20	25	38	62
30	821	.....	370	286	236	100	32	18	21	25	38	62
31	2,780	.....	376	.....	236	.....	29	17	.....	25	.....	62

Monthly discharge of Tule River near Portersville, Cal., for 1911.

[Drainage area, 266 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	2,780	32	289	1.09	1.26	17,800	A.
February	1,520	136	271	1.02	1.06	15,100	A.
March	1,590	128	438	1.65	1.90	26,900	A.
April	657	273	353	1.33	1.48	21,000	A.
May	338	236	283	1.06	1.22	17,400	A.
June	236	100	182	.684	.76	10,800	A.
July	96	29	55.0	.207	.24	3,380	A.
August	26	17	21.7	.082	.09	1,330	B.
September	21	14	16.6	.062	.07	988	B.
October	26	21	24.8	.093	.11	1,520	B.
November	119	26	42.9	.161	.18	2,550	A.
December	64	38	47.7	.179	.21	2,930	A.
The year	2,780	14	168	.632	8.58	122,000	

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SOUTH FORK OF TULE RIVER NEAR SUCCESS, CAL.

Location.—Opposite Indian school on Tule Indian Reservation, about 8 miles above junction with Tule River and 7 miles southeast of Success. Rocky Creek enters about 2 miles above the station.

Records available.—October 10, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on left bank opposite Indian school.

Channel.—Bowlders and gravel and appears permanent.

Discharge measurements.—Car and cable were installed in November, 1911. Previous measurements were made by wading below the gage. Low-water measurements are still made by wading.

Diversions.—Several small irrigation ditches, having a total capacity of about 11 second-feet, divert above the station.

Cooperation.—Gage-height record furnished by United States Indian Office.

Discharge measurements of South Fork of Tule River near Success, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 20[a]	H. J. Tompkins	0.60	13
May 9[a]	do	1.20	64
Nov. 28[b]	do	.55	77

[a] Measurement made by wading ¼ mile below gage.
[b] Measurement made by wading 1 mile below gage.

Daily gage height, in feet, of South Fork of Tule River near Success, Cal., for 1911.

[A. P. Edmonson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.55	1.8	1.0	1.25	1.45	1.0	0.6	0.25	0.15	0.4	0.4	0.5
2	.55	1.6	1.0	1.35	1.4	.9	.6	.25	.15	.4	.4	.5
3	.55	1.4	1.1	1.45	1.3	.9	.55	.25	.15	.38	.4	.5
4	.55	1.6	1.5	1.2	1.2	.9	.55	.25	.15	.35	.4	.5
5	.55	1.35	1.3	2.1	1.25	.9	.5	.25	.15	.4	.45	.5
6	.6	1.3	1.2	2.0	1.35	.95	.5	.25	.15	.4	.45	.55
7	.6	1.2	1.2	1.8	1.35	.9	.5	.25	.15	.4	.4	.6
8	.55	1.1	2.9	1.7	1.25	.9	.5	.25	.15	.4	.4	.6
9	.55	1.0	2.6	1.65	1.2	.9	.5	.2	.15	.5	.4	.6
10	1.5	1.0	3.1	1.6	1.2	.85	.5	.2	.15	.48	.45	.6
11	.95	1.1	2.5	1.5	1.0	.9	.5	.2	.15	.45	.55	.6
12	.9	1.05	2.1	1.5	1.1	1.0	.5	.2	.15	.45	.55	.6
13	.75	1.1	1.9	1.55	1.2	1.0	.5	.25	.15	.45	.55	.6
14	.7	1.7	1.8	1.5	1.25	1.0	.45	.2	.15	.45	.55	.6
15	.7	1.4	1.8	1.5	1.2	.95	.45	.2	.15	.45	.5	.6
16	.7	1.15	1.8	1.4	1.3	.9	.45	.2	.15	.45	.5	.6
17	.65	1.1	1.5	1.3	1.25	.8	.4	.2	.1	.45	.5	.65
18	.7	1.2	1.5	1.2	1.15	.8	.4	.2	.1	.45	.5	.62
19	.65	1.2	1.5	1.2	1.0	.8	.4	.2	.1	.45	.5	.6
20	.65	1.1	1.5	1.4	1.0	.8	.4	.2	.1	.45	.45	.65
21	1.3	1.0	1.6	1.2	1.15	.8	.4	.2	.1	.45	.45	.65
22	1.05	1.0	1.6	.....	1.2	.8	.4	.2	.1	.4	.45	.65
23	.85	1.0	1.5	.....	1.15	.8	.4	.2	.1	.4	.45	.55
24	2.5	1.0	1.5	.....	1.0	.8	.4	.2	.1	.4	.45	.6
25	1.8	1.0	1.5	.....	1.0	.8	.4	.2	.1	.4	.45	.55
26	1.1	.95	1.5	.....	1.0	.8	.4	.2	.1	.4	.5	.5
27	.9	1.0	1.6	1.5	1.0	.75	.3	.2	.12	.4	.5	.5
28	1.1	1.0	1.45	1.5	1.0	.75	.3	.2	.4	.4	.5	.55
29	2.2	.....	1.3	1.45	1.0	.75	.3	.15	.4	.4	.5	.62
30	1.6	.....	1.1	1.4	1.0	.75	.3	.15	.4	.4	.5	.6
31	3.0	.....	1.0	.....	1.0	.....	.25	.15	.....	.4	.....	.6

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BEAR CREEK NEAR SPRINGVILLE, CAL.

Location.—At the Bear Creek ranger station, about 150 feet above mouth of Rancheria Creek, 2¾ miles above junction with North Fork of Tule River, and 6 miles northeast of Springville.

Records available.—January 23 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a sycamore tree on right bank.

Channel.—Sand, gravel, and bowlders and fairly permanent.

Discharge measurements.—Made by wading.

Diversions.—A small irrigation ditch takes out about 300 feet above the station.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of Bear Creek near Springville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 25	H. J. Tompkins	2.25	42
Mar. 14	....do	1.80	22

Daily gage height, in feet, of Bear Creek near Springville, Cal., for 1911.

[W. F. Derby, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.70	.....	1.47	1.30	.....	.....	.....	.....	.....	.....	0.65
2	.....	.....	.....	.....	.....	.....	.....	0.50	.....	.....	.....	.....
3	.....	.....	1.30	.....	.....	0.99	.....	.....	.0.46	.....	0.62	.....
4	.....	1.46	.....	1.49	.....	.....	0.60	.....	.....	0.60	.....	.68
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	1.30	.....	.....	.....	.....	.....	.62	.99
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.58	.....	.....
8	.....	.....	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	.....	.....	3.36	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	.....	.....	2.76	.....	.....	.....	.....	.....	.....	.58	2.10	.....
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.91	.....
12	.....	.....	2.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	1.26	.....	.....	.....	.....	.....	.....	.....
14	.....	2.36	1.85	.....	.....	.91	.....	.....	.....	.56	.....	.....
15	.....	.....	.....	.....	.....	.....	.....	.....	.50	.....	.....	.....
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.85	.....
17	.....	.....	.....	.....	1.16	.....	.....	.....	.....	.55	.....	.....
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.86
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	.....	.....	.....	.....	.....	.70	.....	.....	.....	.....	.....	.....
21	.....	.....	1.46	.....	.....	.....	.....	.50	.50	.....	.....	.....
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.69	.....
23	0.95	.....	.....	1.32	.....	.....	.61	.....	.....	.....	.....	.....
24	2.40	.....	.....	.....	.....	.62	.....	.....	.....	.57	.....	.....
25	2.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
26	1.63	.....	.....	1.33	.....	.....	.....	.....	.....	.59	.....	.....
27	1.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.65	.....
28	1.49	.....	.....	.....	.....	.....	.....	.....	.....	.60	.....	.....
29	2.65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	2.22	.....	.....	1.30	.....	.61	.....	.....	.60	.61	.65	.....
31	4.20	.....	1.47	.....	.98	.....	.51	.45	.....	.....	.....	.....

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KAWEAH RIVER NEAR THREE RIVERS, CAL.

Location.—At the J. O. Carter ranch, in the SE. ¼ sec. 27, T. 17 S., R. 28 E., 1¼ miles southwest of Three Rivers. North Fork enters about 3 miles and South Fork three-fourths of a mile above the station.

Records available.—April 29, 1903, to December 31, 1911.

Drainage area.—520 square miles.

Gage.—Staff in two sections on left bank one-fourth mile back of observer's house. Vertical high-water section fastened to willow tree, inclined low-water section fastened to posts.

Channel.—Gravel and bowlders and fairly permanent.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—Several small ditches divert water for local irrigation and domestic use above the station. Power is also developed on the Middle and East forks.

Accuracy.—Results for 1911 are fairly good.

Discharge measurements of Kaweah River near Three Rivers, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 31	H. J. Tompkins	9.85	5,500
May 20	Wickert and Tompkins	7.75	2,160
June 9	W. V. Hardy	7.50	2,010
Sept. 12	J. E. Stewart [a]	4.58	83

[a] Made by wading 1¼ miles below gage.

Daily gage height, in feet, of Kaweah River near Three Rivers, Cal., for 1911.

[J. O. Carter, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.53	7.48	5.62	7.02	6.92	.....	6.90	5.55	4.60	4.74	4.50	4.57
2	4.58	6.88	5.62	6.92	6.92	6.85	6.85	5.44	4.60	4.68	4.50	4.57
3	4.56	6.60	5.74	6.92	7.08	7.12	6.90	5.40	4.60	4.74	4.50	4.58
4	4.58	6.85	6.55	6.85	7.30	7.55	6.85	5.36	4.59	4.64	4.50	4.60
5	4.52	6.38	6.15	7.35	7.38	.....	6.88	5.32	4.55	4.62	4.50	4.60
6	4.58	6.22	6.10	7.10	7.20	.....	6.80	5.36	.....	4.61	4.50	4.63
7	4.52	6.10	6.30	6.95	7.28	7.75	6.78	5.28	4.53	4.59	4.50	4.65
8	4.55	6.02	8.75	6.85	7.50	7.90	6.70	5.24	4.52	4.56	4.50	4.64
9	4.58	5.95	7.55	6.82	7.20	7.50	6.60	5.21	4.51	4.58	4.50	4.61
10	6.45	5.94	8.25	6.78	7.30	7.75	6.62	5.20	4.51	4.55	4.61	4.60
11	5.30	5.95	7.20	6.68	.....	8.15	6.48	5.16	4.51	.....	4.96	4.60
12	5.08	5.84	6.90	6.55	7.32	8.15	6.50	5.12	4.54	.....	4.66	4.60
13	5.01	6.18	6.62	6.60	7.30	8.20	6.45	5.08	4.55	.....	4.62	4.60
14	4.99	6.22	6.57	6.48	7.30	8.15	6.42	5.05	4.53	4.52	4.58	4.60
15	5.24	5.94	6.62	6.54	7.05	7.80	6.62	5.02	4.50	4.53	4.64	4.60
16	5.20	5.85	6.55	6.58	6.90	7.85	6.54	4.98	4.50	4.52	4.71	4.60
17	5.02	5.82	6.52	6.68	6.92	8.00	6.58	4.95	4.50	4.50	4.62	4.69
18	4.98	5.82	6.55	6.78	7.00	7.90	6.60	4.92	4.50	4.50	4.58	4.65
19	4.92	5.82	6.55	6.90	7.30	7.75	6.40	4.89	4.46	4.50	4.60	4.60
20	4.92	5.79	6.52	6.92	7.48	7.60	6.21	4.88	4.44	4.50	4.60	4.60
21	6.28	5.70	6.60	6.92	7.62	7.50	6.10	4.83	4.46	4.50	4.60	4.62
22	5.64	5.70	6.59	7.00	7.85	7.40	6.05	4.78	4.56	4.49	4.60	.....
23	5.41	5.70	6.48	7.10	8.30	7.28	5.98	4.78	4.68	4.49	4.55	4.65
24	6.55	5.74	6.55	7.15	.....	7.08	5.96	4.74	4.60	4.49	4.55	4.62
25	7.10	5.68	6.55	7.15	7.55	7.02	5.88	4.71	4.50	4.49	4.55	4.58
26	6.29	5.68	6.56	7.20	7.15	7.20	5.78	4.68	4.57	4.49	4.55	4.60
27	5.82	5.60	6.55	7.15	7.15	7.20	5.72	4.65	4.56	.....	4.55	4.65
28	5.70	5.61	6.62	6.95	7.30	7.15	5.68	4.64	4.54	.....	4.55	4.72
29	10.00	.....	6.74	6.79	7.25	7.10	5.56	4.64	4.49	4.50	4.55	4.70
30	9.05	.....	6.82	6.82	7.15	6.98	5.60	4.61	4.94	4.50	4.56	4.68
31	9.70	.....	6.92	.....	7.00	.....	5.58	4.60	.....	4.50	.....	4.68

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Daily discharge, in second-feet, of Kaweah River near Three Rivers, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	68	1,920	391	1,390	1,290	1,300	1,270	362	86	113	70	81
2	77	1,250	391	1,280	1,280	1,220	1,220	318	86	101	70	81
3	73	1,000	445	1,290	1,450	1,500	1,270	303	86	113	70	88
4	77	1,220	960	1,220	1,700	2,020	1,220	289	84	96	70	86
5	66	831	678	1,760	1,800	2,110	1,250	275	78	90	70	89
6	77	723	649	1,480	1,580	2,210	1,189	269	76	88	70	92
7	66	645	775	1,320	1,680	2,300	1,160	261	75	84	70	96
8	72	597	4,000	1,220	1,950	2,530	1,080	248	73	80	70	94
9	77	555	2,020	1,199	1,580	1,950	1,080	239	72	83	70	88
10	1,010	549	3,120	1,160	1,700	2,300	1,020	235	72	78	88	86
11	271	555	1,580	1,070	1,710	2,940	905	223	72	77	166	86
12	196	494	1,270	960	1,720	2,940	920	210	76	76	97	86
13	176	607	1,020	1,000	1,700	3,030	882	198	78	74	90	86
14	170	723	976	905	1,700	2,940	860	190	75	73	83	86
15	249	549	1,020	952	1,420	2,370	1,020	182	70	75	94	86
16	235	499	960	984	1,270	2,450	952	171	70	73	107	86
17	179	488	986	1,070	1,280	2,690	984	163	70	70	90	103
18	168	483	960	1,160	1,370	2,530	1,000	155	70	70	83	96
19	151	483	960	1,270	1,700	2,300	845	148	64	70	86	86
20	151	468	936	1,290	1,920	2,080	716	145	62	70	86	86
21	353	426	1,000	1,290	2,110	1,950	645	133	64	70	86	90
22	419	426	992	1,370	2,450	1,820	615	122	80	69	86	93
23	314	426	905	1,480	3,200	1,680	573	122	101	69	78	96
24	1,100	445	960	1,530	2,610	1,450	561	113	86	69	78	90
25	1,720	417	960	1,530	2,020	1,390	515	107	70	69	78	83
26	862	417	968	1,580	1,530	1,580	464	101	81	69	78	86
27	520	382	960	1,530	1,530	1,580	435	96	80	69	78	96
28	449	386	1,020	1,320	1,700	1,530	417	94	76	70	78	109
29	6,610	.....	1,120	1,170	1,640	1,480	366	94	69	70	78	105
30	4,560	.....	1,190	1,190	1,530	1,350	382	88	160	70	80	101
31	5,920	.....	1,290	.....	1,370	.....	374	86	.....	70	.....	101

NOTE.—Daily discharge determined from two fairly well defined rating curves, applicable Jan. 1–28 and Jan. 29 to Dec. 31. Discharge interpolated for days on which gage was not read.

Monthly discharge of Kaweah River near Three Rivers, Cal., for 1911.

[Drainage area, 520 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	6,610	66	869	1.67	1.92	53,400	B.
February	1,920	382	645	1.24	1.29	35,800	B.
March	4,000	391	1,140	2.19	2.52	70,100	B.
April	1,760	905	1,270	2.44	2.72	75,600	B.
May	3,200	1,270	1,730	3.33	3.84	106,000	B.
June	3,030	1,220	2,050	3.94	4.40	122,000	B.
July	1,270	366	842	1.62	1.87	51,800	B.
August	362	86	186	.358	.41	11,400	B.
September	160	62	78.7	.151	.17	4,680	B.
October	113	69	78.0	.150	.17	4,800	B.
November	166	70	83.3	.160	.18	4,960	B.
December	109	81	90.6	.174	.20	5,570	B.
The year	6,610	62	754	1.45	19.69	546,000	

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NORTH FORK OF KAWEAH RIVER AT KAWEAH, CAL.

Location.—At highway bridge in the SW. ¼ sec. 2, T. 17 S., R. 28 E., Sequoia National Forest, about half a mile north of Kaweah and 2 miles above junction with Kaweah River.

Records available.—October 12, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to right abutment of bridge.

Channel.—Solid rock and sand and fairly permanent.

Discharge measurements.—Made from bridge at gage and by wading.

Diversions.—Approximately 20 second-feet is diverted by several sma'l ditches for irrigation above the station.

Accuracy.—Results are good at low stages; publication of discharge is withheld until confirmatory measurements can be secured for high stages.

Cooperation.—Previous to October 1, 1911, gage-height record was furnished by United States Forest Service. Discharge measurements also furnished by the Forest Service in 1911.

Discharge measurements of North Fork of Kaweah River at Kaweah, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 27	H. J. Tompkins	1.82	151
29	....do	5.00	2,000
29	....do	5.20	[b] 2,060
29	....do	5.55	[b] 2,540
30	....do	4.20	1,510
Feb. 1	....do	3.00	729
Mar. 10	Tompkins and Purdy	3.65	1,120
11	H. J. Tomkpins	2.96	675
12	....do	2.68	499
May 19	....do	2.45	344
Sept. 17[a]	....do	.60	7.0

[a] By wading 2 miles below gage. [b] Measurement very unreliable.

NOTE.—All measurements above 600 second-feet liable to considerable error.

Daily gage height, in feet, of North Fork of Kaweah River at Kaweah, Cal., for 1911.

[G. W. Purdy and L. Weckert, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.0	.....	2.7	2.4	2.2	1.5	0.9	0.6	0.7	0.7	0.8
2	0.74	.....	.....	2.6	2.45	2.1	1.55	.9	.6	.....	.7	.8
3	.75	.....	1.75	2.7	2.45	2.1	1.45	.85	.6	.....	.7	.8
4	.78	.....	.....	.....	2.55	2.1	1.5	.85	.6	.....	.7	.8
5	.....	.....	2.8	2.9	2.7	2.3	1.4	.85	.6	.....	.7	.8
6	.79	.....	.....	2.85	2.55	2.2	.....	.85	.6	.....	.7	.8
7	.78	.....	2.35	2.7	2.55	2.2	.....	.85	.6	.....	.7	.8
8	.....	.....	4.1	2.6	.....	2.2	.....	.85	.6	.....	.7	.85
9	.83	.....	3.1	2.55	2.55	.....	1.3	.85	.6	.....	.7	.9
10	1.92	.....	3.65	2.5	2.5	.....	1.3	.85	.6	.....	.95	.85
11	1.30	.....	3.0	2.4	2.5	.....	1.25	.85	.6	.....	1.12	.85
12	1.22	.....	2.7	2.4	2.5	2.1	1.25	.8	.6	.....	.9	.8
13	1.15	.....	2.5	2.35	2.5	2.1	1.2	.8	.6	.....	.85	.85
14	1.12	2.00	2.45	2.35	2.4	.....	1.2	.8	.6	.....	.85	.85
15	1.55	.....	.....	2.3	2.3	.....	1.15	.75	.6	.7	.85	.9
16	1.35	.....	.....	2.35	.....	.....	1.1	.75	.6	.7	.85	.9
17	.....	.....	2.5	2.45	.....	2.0	1.1	.75	.6	.7	.85	.9
18	.....	1.80	2.45	2.5	.....	1.95	1.1	.7	.6	.7	.8	.9
19	.....	1.80	2.35	2.55	2.45	.....	1.2	.7	.6	.7	.8	.9
20	.....	1.80	2.4	2.5	2.4	1.9	1.15	.7	.6	.7	.8	.9

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WHITE RIVER NEAR HOT SPRINGS, CAL.

Location.—On Vaughn ranch, 1 mile east of White River and Hot Springs stage road, about 5 miles southwest of Hot Springs.

Records available.—January 18 to December 31, 1911

Drainage area.—Not measured.

Gage.—Vertical staff on right bank fastened to a willow tree about 150 feet above observer's house.

Channel.—Sand and gravel.

Discharge measurements.—Made by wading.

Cooperation.—Gage-height record furnished by David Vaughn. Discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements can be made.

Discharge measurements of White River near Hot Springs, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 18	H. J. Tompkins	1.4	2.0
May 11	.....do	1.6	4.0

Daily gage height, in feet, of White River near Hot Springs, Cal., for 1911.

[David Vaughn, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.9	1.7	.....	1.7	1.5	1.3	.....	.....	1.25	1.2	1.2
2	.....	1.8	1.7	.....	1.7	1.5	1.3	.....	.....	1.25	1.2	1.2
3	.....	1.7	1.8	.....	1.7	1.5	1.3	.....	.....	1.3	1.2	1.2
4	.....	2.0	1.9	.....	1.7	1.5	1.25	.....	.....	1.3	1.2	1.4
5	.....	1.8	1.8	.....	1.7	1.5	1.25	.....	.....	1.3	1.2	1.4
6	.....	1.7	1.8	.....	1.7	1.45	1.25	.....	.....	1.3	1.2	1.3
7	.....	1.7	1.7	.....	1.7	1.45	1.25	.....	.....	1.25	1.2	1.4
8	.....	1.6	2.2	.....	1.7	1.45	1.2	.....	.....	1.25	1.2	1.4
9	.....	1.6	2.2	.....	1.7	1.4	1.2	.....	.....	1.25	1.2	1.3
10	.....	1.6	2.7	.....	1.65	1.4	1.2	.....	.....	1.25	1.7	1.3
11	.....	1.7	2.7	.....	1.6	1.4	1.2	.....	.....	1.25	1.5	1.3
12	.....	1.5	2.3	.....	1.6	1.4	1.2	.....	.....	1.25	1.4	1.3
13	.....	1.95	2.1	.....	1.6	1.4	1.2	.....	.....	1.25	1.4	1.3
14	.....	2.2	2.0	1.8	1.6	1.4	1.2	.....	.....	1.25	1.3	1.25
15	.....	1.9	2.0	1.8	1.6	1.4	1.15	.....	.....	1.25	1.3	1.25
16	.....	1.8	1.9	1.8	1.5	1.4	1.15	.....	.....	1.25	1.3	1.25
17	.....	1.8	1.9	1.8	1.5	1.4	1.2	.....	.....	1.25	1.4	1.5
18	1.4	1.8	1.9	1.8	1.5	1.4	1.18	.....	.....	1.25	1.3	1.45
19	1.4	1.8	1.8	1.8	1.5	1.4	1.2	.....	.....	1.25	1.3	1.45
20	1.4	1.8	1.8	1.75	1.5	1.4	1.2	.....	.....	1.25	1.3	1.4
21	2.1	1.8	2.0	1.7	1.5	1.35	1.2	.....	.....	1.2	1.25	1.4
22	1.7	1.8	2.0	1.7	1.5	1.35	1.15	.....	.....	1.2	1.25	1.4
23	1.6	1.7	1.9	1.7	1.5	1.35	1.15	.....	.....	1.2	1.25	1.3
24	1.95	1.7	2.1	1.7	1.5	1.35	1.15	.....	.....	1.2	1.25	1.3
25	2.0	1.7	2.0	1.7	1.5	1.35	1.15	.....	1.15	1.2	1.25	1.3
26	2.0	1.7	1.9	1.7	1.5	1.3	1.15	.....	1.15	1.2	1.25	1.3
27	1.7	1.8	1.9	1.9	1.5	1.3	1.15	.....	1.15	1.2	1.25	1.3
28	1.8	1.8	.....	1.8	1.5	1.3	1.15	.....	1.2	1.25	1.2	1.4
29	.1	.....	.....	1.8	1.5	1.3	1.1	.....	1.2	1.25	1.2	1.4
30	1.9	.....	.....	1.7	1.5	1.3	.....	.....	1.2	1.25	1.2	1.5
31	2.3	.....	.....	.....	1.5	.....	.....	.....	.....	1.25	.....	1.4

NOTE.—No water in river July 30 to September 24.

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DEER CREEK AT HOT SPRINGS, CAL.

Location.—Below footbridge at forest supervisor's headquarters in the Sequoia National Forest, about half a mile below Hot Springs. Tyler Creek enters about 2½ miles below the station.

Records available.—October 7, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on left bank, 30 feet below footbridge.

Channel.—Sand, gravel, and bowlders.

Discharge measurements.—Made from highway bridge, 100 feet below gage or by wading.

Diversions.—Irrigation ditches head above the station.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are made.

Discharge measurements of Deer Creek at Hot Springs, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 15	H. J. Tompkins	0.55	6.1
Mar. 7	do	.50	7.2
May 13	do	.70	12

NOTE.—Measurements were made by wading.

Daily gage height, in feet, of Deer Creek at Hot Springs, Cal., for 1911.

[A. B. Patterson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.51	0.85	0.58	0.82	0.80	.....	.....	0.30	0.35	0.39	0.41	0.46
2	.....	.....	.....	.80	.80	.....	0.44	.31	.35	.40	.42	.46
3	.....	.65	.68	.78	.80	0.60	.45	.31	.36	.40	.42	.49
4	.....	.80	.70	.77	.81	.59	.45	.31	.37	.40	.42	.50
5	.51	.69	.69	1.06	.81	.59	.44	.31	.37	.39	.41	.52
6	.....	.63	.67	1.05	.80	.60	.43	.35	.37	.39	.42	.60
7	.....	.....	.65	1.00	.80	.59	.43	.34	.37	.39	.42	.57
8	.....	.....	1.35	.90	.80	.58	.42	.33	.36	.40	.42	.52
9	.52	.61	1.12	.88	.80	.....	.42	.35	.33	.41	.42	.51
10	.80	.58	1.30	.88	.....	.....	.42	.35	.35	.42	.62	.51
11	.59	.60	1.00	.87	.70	.....	.41	.35	.35	.42	.50	.51
12	.52	.58	.90	.85	.70	.....	.41	.35	.32	.42	.43	.51
13	.51	.95	.90	.86	.70	.....	.40	.35	.32	.42	.42	.51
14	.51	.83	.82	.82	.70	.....	.40	.36	.31	.43	.43	.51
15	.52	.68	.81	.81	.70	.....	.38	.36	.31	.43	.43	.51
16	.52	.70	.80	.81	.69	.....	.39	.35	.32	.42	.43	.51
17	.....	.68	.79	.81	.69	.....	.39	.36	.34	.42	.43	.51
18	.....	.60	.72	.81	.69	.....	.40	.35	.35	.41	.44	.51
19	.50	.....	.75	.80	.68	.....	.39	.35	.34	.42	.44	.55
20	.64	.60	.75	.80	.67	.....	.....	.35	.34	.42	.45	.57
21	.85	.61	.84	.80	.66	.....	.....	.35	.35	.43	.45	.53
22	.....	.....	.81	.81	.65	.....	.....	.35	.37	.43	.45	.50
23	.....	.....	.79	.80	.64	.....	.....	.36	.36	.43	.46	.50
24	.84	.60	.82	.79	.63	.....	.....	.36	.35	.43	.46	.49
25	.90	.....	.79	.79	.61	.....	.....	.35	.36	.43	.46	.47
26	.80	.....	.78	.80	.61	.....	.....	.36	.37	.43	.46	.45
27	.65	.60	.75	.80	.61	.....	.31	.37	.38	.43	.46	.45
28	1.00	.....	.75	.82	.61	.44	.31	.37	.38	.43	.46	.46
29	.80	.....	.77	.80	.61	.45	.30	.37	.43	.43	.46	.45
30	.....	.....	.78	.80	.61	.45	.31	.37	.39	.42	.46	.50
31	1.20	.....	.78	.....	.61	.....	.31	.36	.....	.42	.....	.53

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TYLER CREEK NEAR HOT SPRINGS, CAL.

Location.—Below foot log at the Thompson ranch, in Sequoia National Forest, about 1½ miles north of Hot Springs and about 4 miles above junction with Deer Creek.

Records available.—January 16 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank 100 feet below observer's house.

Channel.—Bowlders and sand.

Discharge measurements.—Made by wading.

Diversions.—Three small irrigation ditches divert above the station.

Cooperation.—Gage height record furnished by D. B. Thompson. Discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements can be made.

Discharge measurements of Tyler Creek near Hot Springs, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 16	H. J. Tompkins	1.00	4.0
Mar. 7	do	1.10	6.4
May 12	do	1.00	6.9

NOTE.—These measurements were made by wading.

Daily gage height, in feet, of Tyler Creek near Hot Springs, Cal., for 1911.

[D. B. Thompson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.3	1.1	1.2	1.15	1.0	0.8	.....	.....	.....	.....	.....
2	.....	1.15	.....	1.2	1.15	.....	.....	.....	.....	0.6	0.7	.....
3	.....	1.1	.....	1.2	.....	1.0	.....	0.5	0.4	.....	.....	0.5
4	.....	1.2	.....	.....	1.15	.....	.....	.....	.....	.....	.....	.....
5	.....	1.1	1.2	.....	.....	1.0	.7	.....	.....	.....	.....	.....
6	.....	1.1	1.2	1.5	.....	1.0	.....	.5	.....	.....	.....	.....
7	.....	1.2	1.1	.....	1.15	1.0	.....	.....	.....	.....	.7	.5
8	.....	1.1	1.85	.....	.....	1.0	.5	.....	.....	.....	.....	.....
9	.....	1.1	1.7	1.3	.....	1.0	.....	.....	.4	.7	.....	.....
10	.....	1.0	1.75	.....	1.1	1.0	.....	.5	.....	.....	.....	.6
11	.....	1.1	.....	1.3	.....	.....	.....	.....	.....	.....	.....	.....
12	.....	1.05	1.5	.....	1.1	.....	.....	.....	.....	.....	.7	.....
13	.....	1.3	1.5	.....	.....	1.0	.....	.....	.....	.6	.....	.....
14	.....	1.25	.....	1.3	1.1	.....	.....	.....	.....	.....	.....	.6
15	.....	1.2	1.3	.....	.....	.....	.....	.....	.4	.....	.....	.....
16	1.0	1.2	1.3	1.2	1.1	.....	.....	.....	.....	.6	.6	.....
17	.....	1.15	1.3	.....	1.1	.....	.5	.....	.....	.....	.....	.....
18	1.0	1.1	.....	1.2	1.1	.....	.....	.5	.....	.....	.....	.6
19	1.0	1.1	1.3	1.2	1.1	.9	.....	.....	.....	.....	.6	.....
20	1.0	1.1	.....	1.2	.....	.....	.....	.....	.....	.6	.....	.....
21	1.25	1.1	.....	.....	1.1	.....	.....	.....	.5	.....	.....	.....
22	1.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
23	.....	1.1	.....	.....	1.1	.....	.5	.5	.....	.....	.5	.6
24	1.3	1.1	.....	1.15	.....	.9	.....	.....	.....	.....	.....	.....
25	1.4	1.1	1.3	1.15	1.1	.....	.....	.....	.....	.7	.....	.....
26	1.2	1.1	1.3	1.2	.....	.....	.....	.4	.6	.....	.....	.....
27	1.2	.....	1.2	1.2	1.1	.....	.....	.....	.....	.....	.....	.....
28	1.2	1.1	1.2	.....	.....	.....	.....	.....	.....	.....	.....	.7
29	1.55	.....	1.2	.....	1.05	.....	.....	.....	.6	.7	.5	.....
30	1.2	.....	1.2	.....	.....	.....	.5	.4	.....	.....	.....	.....
31	1.45	.....	1.2	.....	.....	.....	.....	.....	.....	.....	.....	.....

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TULE RIVER NEAR PORTERSVILLE, CAL.

Location.—Below highway bridge near the McFarland ranch, in the NW. ¼ NW. ¼ sec. 25, T. 21 S., R. 28 E., about 1 mile above mouth of South Fork and 6 miles east of Portersville. The North and Middle forks of Tule River unite about 9 miles above the station.

Records available.—May 1, 1901, to December 31, 1911.

Drainage area.—266 square miles.

Gage.—Staff in two sections on right bank, 100 feet below bridge; vertical upper section nailed to willow tree; inclined low-water section fastened to posts.

Channel.—Gravel and small bowlders, and is practically permanent.

Discharge measurements.—Made from bridge above gage or by wading.

Diversions.—Several small irrigation ditches divert water above the station.

Accuracy.—Results good.

Discharge measurements of Tule River near Portersville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 21	H. J. Tompkins	2.60	312
June 8	W. V. Hardy	2.39	229

Daily gage height, in feet, of Tule River near Portersville, Cal., for 1911.

[Martha Brough, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.20	5.0	1.85	2.90	2.60	2.40	1.65	1.00	0.83	0.91	1.00	1.15
2	1.20	3.10	1.88	2.95	2.55	2.30	1.60	1.00	.81	.93	1.00	1.15
3	1.20	2.80	2.00	2.90	2.60	2.25	1.55	1.00	.80	.95	1.00	1.15
4	1.20	3.50	2.60	2.95	2.70	2.30	1.50	1.00	.80	.96	1.00	1.15
5	1.20	2.62	2.40	3.60	2.75	2.30	1.45	.99	.81	.97	1.00	1.15
6	1.20	2.50	2.40	3.45	2.78	2.35	1.48	.98	.82	.99	1.00	1.20
7	1.08	2.40	2.50	3.10	2.70	2.40	1.40	.97	.84	1.00	1.00	1.30
8	1.18	2.35	4.90	3.00	2.65	2.40	1.38	.96	.86	1.00	1.00	1.30
9	1.21	2.30	4.00	2.95	2.63	2.40	1.36	.95	.88	1.00	1.00	1.30
10	2.75	2.20	5.10	2.90	2.60	2.35	1.35	.95	.87	1.00	1.80	1.29
11	1.80	2.15	3.90	2.80	2.60	2.30	1.34	.94	.86	1.00	1.60	1.28
12	1.60	2.20	3.40	2.73	2.60	2.28	1.33	.93	.85	.99	1.50	1.27
13	1.52	2.18	3.20	2.68	2.60	2.27	1.32	.93	.84	.98	1.40	1.26
14	1.45	2.90	3.00	2.60	2.60	2.26	1.31	.93	.83	.98	1.30	1.24
15	1.45	2.40	2.85	2.57	2.60	2.25	1.30	.93	.82	.98	1.20	1.22
16	1.45	2.20	2.80	2.60	2.58	2.24	1.30	.92	.80	.98	1.20	1.22
17	1.42	2.15	2.80	2.55	2.58	2.23	1.30	.92	.80	.98	1.20	1.22
18	1.40	2.10	2.81	2.60	2.57	2.20	1.30	.92	.80	.98	1.20	1.22
19	1.38	2.05	2.80	2.60	2.56	2.10	1.29	.91	.81	.98	1.20	1.22
20	1.38	2.00	2.80	2.65	2.55	2.05	1.28	.90	.82	.98	1.20	1.22
21	2.80	2.00	3.05	2.65	2.55	2.00	1.27	.90	.83	.98	1.20	1.22
22	2.10	2.00	2.81	2.65	2.56	1.95	1.25	.90	.84	.98	1.20	1.22
23	1.90	2.00	2.75	2.70	2.57	1.90	1.23	.90	.85	.98	1.20	1.22
24	3.02	1.99	2.80	2.75	2.58	1.88	1.21	.90	.86	.98	1.15	1.22
25	3.65	1.98	2.85	2.80	2.59	1.84	1.20	.90	.87	.98	1.15	1.22
26	2.75	1.96	2.75	2.85	2.60	1.80	1.18	.90	.88	.98	1.15	1.22
27	2.25	1.95	2.74	2.90	2.60	1.78	1.15	.89	.88	.98	1.15	1.25
28	2.10	1.90	2.76	2.75	2.50	1.75	1.12	.88	.89	.98	1.15	1.40
29	4.90	.....	2.80	2.60	2.40	1.70	1.10	.87	.90	.98	1.15	1.38
30	3.92	.....	2.88	2.60	2.40	1.68	1.08	.86	.91	.98	1.15	1.38
31	6.60	.....	2.90	.....	2.40	.....	1.04	.85	.....	.98	.....	1.38

NOTE.—Daily discharge determined from a well-defined rating curve.

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Daily discharge, in second-feet, of Tule River near Portersville, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	43	1,520	128	376	286	236	96	26	16	21	26	38
2	43	445	133	393	273	214	88	26	15	22	26	38
3	43	344	154	376	286	204	82	26	14	23	26	38
4	43	610	286	393	314	214	75	26	14	24	26	38
5	43	292	236	657	329	214	70	25	15	24	26	28
6	43	260	236	588	338	225	73	25	15	25	26	43
7	32	236	260	445	314	236	64	24	16	26	26	53
8	41	225	1,440	410	300	236	62	24	18	26	26	53
9	44	214	865	393	294	236	60	23	19	26	26	53
10	329	193	1,590	376	286	225	58	23	18	26	119	52
11	119	183	810	344	286	214	57	22	18	26	88	51
12	88	193	565	323	286	210	56	22	17	25	75	50
13	78	189	483	308	286	206	55	22	16	25	64	49
14	70	376	410	286	286	206	54	22	16	25	53	47
15	70	236	360	278	286	204	53	22	15	25	43	45
16	70	193	344	286	281	201	53	21	14	25	43	45
17	66	183	344	273	281	199	53	21	14	25	43	45
18	64	173	347	286	278	193	53	21	14	25	43	45
19	62	164	344	286	276	173	52	21	15	25	43	45
20	62	154	344	300	273	164	51	20	15	25	43	45
21	344	154	428	300	273	154	50	20	16	25	43	45
22	173	154	347	300	276	145	48	20	16	25	43	45
23	136	154	329	314	278	136	46	20	17	25	43	45
24	417	152	344	329	281	133	44	20	18	25	38	45
25	682	150	360	344	283	126	43	20	18	25	38	45
26	329	147	329	360	286	119	41	20	19	25	38	45
27	204	145	326	376	286	116	38	19	19	25	38	48
28	173	136	332	329	260	111	36	19	19	25	38	64
29	1,440	.....	344	286	236	103	34	18	20	25	38	62
30	821	.....	370	286	236	100	32	18	21	25	38	62
31	2,780	.....	376	.....	236	.....	29	17	.....	25	.....	62

Monthly discharge of Tule River near Portersville, Cal., for 1911.

[Drainage area, 266 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	2,780	32	289	1.09	1.26	17,800	A.
February	1,520	136	271	1.02	1.06	15,100	A.
March	1,590	128	438	1.65	1.90	26,900	A.
April	657	273	353	1.33	1.48	21,000	A.
May	338	236	283	1.06	1.22	17,400	A.
June	236	100	182	.684	.76	10,800	A.
July	96	29	55.0	.207	.24	3,380	A.
August	26	17	21.7	.082	.09	1,330	B.
September	21	14	16.6	.062	.07	988	B.
October	26	21	24.8	.093	.11	1,520	B.
November	119	26	42.9	.161	.18	2,550	A.
December	64	38	47.7	.179	.21	2,930	A.
The year	2,780	14	168	.632	8.58	122,000	

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SOUTH FORK OF TULE RIVER NEAR SUCCESS, CAL.

Location.—Opposite Indian school on Tule Indian Reservation, about 8 miles above junction with Tule River and 7 miles southeast of Success. Rocky Creek enters about 2 miles above the station.

Records available.—October 10, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on left bank opposite Indian school.

Channel.—Bowlders and gravel and appears permanent.

Discharge measurements.—Car and cable were installed in November, 1911. Previous measurements were made by wading below the gage. Low-water measurements are still made by wading.

Diversions.—Several small irrigation ditches, having a total capacity of about 11 second-feet, divert above the station.

Cooperation.—Gage-height record furnished by United States Indian Office.

Discharge measurements of South Fork of Tule River near Success, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 20[a]	H. J. Tompkins	0.60	13
May 9[a]	....do	1.20	64
Nov. 28[b]	....do	.56	77

[a] Measurement made by wading ¼ mile below gage.
[b] Measurement made by wading 1 mile below gage.

Daily gage height, in feet, of South Fork of Tule River near Success, Cal., for 1911.

[A. P. Edmonson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.55	1.8	1.0	1.25	1.45	1.0	0.6	0.25	0.15	0.4	0.4	0.5
2	.55	1.6	1.0	1.35	1.4	.9	.6	.25	.15	.4	.4	.5
3	.55	1.4	1.1	1.45	1.3	.9	.55	.25	.15	.38	.4	.5
4	.55	1.6	1.5	1.2	1.2	.9	.55	.25	.15	.35	.4	.5
5	.55	1.35	1.3	2.1	1.25	.9	.5	.25	.15	.4	.45	.5
6	.6	1.3	1.2	2.0	1.35	.95	.5	.25	.15	.4	.45	.55
7	.6	1.2	1.2	1.8	1.35	.9	.5	.25	.15	.4	.4	.6
8	.55	1.1	2.9	1.7	1.25	.9	.5	.25	.15	.4	.4	.6
9	.55	1.0	2.6	1.65	1.2	.9	.5	.2	.15	.5	.4	.6
10	1.5	1.0	3.1	1.6	1.2	.85	.5	.2	.15	.48	.45	.6
11	.95	1.1	2.5	1.5	1.0	.9	.5	.2	.15	.45	.55	.6
12	.9	1.05	2.1	1.5	1.1	1.0	.5	.2	.15	.45	.55	.6
13	.75	1.1	1.9	1.55	1.2	1.0	.5	.25	.15	.45	.55	.6
14	.7	1.7	1.8	1.5	1.25	1.0	.45	.2	.15	.45	.55	.6
15	.7	1.4	1.8	1.5	1.2	.95	.45	.2	.15	.45	.5	.6
16	.7	1.15	1.8	1.4	1.3	.9	.45	.2	.15	.45	.5	.6
17	.65	1.1	1.5	1.3	1.25	.8	.4	.2	.1	.45	.5	.65
18	.7	1.2	1.5	1.2	1.15	.8	.4	.2	.1	.45	.5	.62
19	.65	1.2	1.5	1.2	1.0	.8	.4	.2	.1	.45	.5	.6
20	.65	1.1	1.5	1.4	1.0	.8	.4	.2	.1	.45	.45	.65
21	1.3	1.0	1.6	1.2	1.15	.8	.4	.2	.1	.45	.45	.65
22	1.05	1.0	1.6	.....	1.2	.8	.4	.2	.1	.4	.45	.65
23	.85	1.0	1.5	.....	1.15	.8	.4	.2	.1	.4	.45	.65
24	2.5	1.0	1.5	.....	1.0	.8	.4	.2	.1	.4	.45	.6
25	1.8	1.0	1.5	.....	1.0	.8	.4	.2	.1	.4	.45	.55
26	1.1	.95	1.5	.....	1.0	.8	.4	.2	.1	.4	.5	.5
27	.9	1.0	1.6	1.5	1.0	.75	.3	.2	.12	.4	.5	.5
28	1.1	1.0	1.45	1.5	1.0	.75	.3	.2	.4	.4	.5	.55
29	2.2	.....	1.3	1.45	1.0	.75	.3	.15	.4	.4	.5	.62
30	1.6	.....	1.1	1.4	1.0	.75	.3	.15	.4	.4	.5	.6
31	3.0	.....	1.0	.....	1.0	.....	.25	.15	.....	.4	.....	.6

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BEAR CREEK NEAR SPRINGVILLE, CAL.

Location.—At the Bear Creek ranger station, about 150 feet above mouth of Rancheria Creek, 2¼ miles above junction with North Fork of Tule River, and 6 miles northeast of Springville.

Records available.—January 23 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a sycamore tree on right bank.

Channel.—Sand, gravel, and bowlders and fairly permanent.

Discharge measurements.—Made by wading.

Diversions.—A small irrigation ditch takes out about 300 feet above the station.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of Bear Creek near Springville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 25	H. J. Tompkins	2.25	42
Mar. 14	.....do	1.80	22

Daily gage height, in feet, of Bear Creek near Springville, Cal., for 1911.

[W. F. Derby, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.70		1.47	1.30							0.65
2								0.50				
3			1.30			0.99			0.46		0.62	
4		1.46		1.49			0.60			0.60		.68
5												
6					1.30						.62	.99
7										.58		
8			3.00									
9			3.36									
10			2.76							.58	2.10	
11											.91	
12			2.00									
13					1.26							
14		2.36	1.85			.91				.56		
15									.50			
16											.85	
17					1.16					.55		
18												.86
19												
20						.70						
21			1.46					.50	.50			
22											.69	
23	0.95			1.32			.61					
24	2.40					.62				.57		
25	2.15											
26	1.63			1.33						.59		
27	1.30										.65	
28	1.49									.60		
29	2.65											
30	2.22			1.30		.61			.60	.61	.65	
31	4.20		1.47		.98		.51	.45				

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KAWEAH RIVER NEAR THREE RIVERS, CAL.

Location.—At the J. O. Carter ranch, in the SE. ¼ sec. 27, T. 17 S., R. 28 E., 1½ miles southwest of Three Rivers. North Fork enters about 3 miles and South Fork three-fourths of a mile above the station.

Records available.—April 29, 1903, to December 31, 1911.

Drainage area.—520 square miles.

Gage.—Staff in two sections on left bank one-fourth mile back of observer's house. Vertical high-water section fastened to willow tree, inclined low-water section fastened to posts.

Channel.—Gravel and bowlders and fairly permanent.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—Several small ditches divert water for local irrigation and domestic use above the station. Power is also developed on the Middle and East forks.

Accuracy.—Results for 1911 are fairly good.

Discharge measurements of Kaweah River near Three Rivers, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 31	H. J. Tompkins	9.85	5,500
May 20	Wickert and Tompkins	7.75	2,160
June 9	W. V. Hardy	7.50	2,010
Sept. 12	J. E. Stewart [a]	4.58	83

[a] Made by wading 1½ miles below gage.

Daily gage height, in feet, of Kaweah River near Three Rivers, Cal., for 1911.

[J. O. Carter, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.53	7.48	5.62	7.02	6.92	.....	6.90	5.55	4.60	4.74	4.50	4.57
2	4.58	6.88	5.62	6.92	6.92	6.85	6.85	5.44	4.60	4.68	4.50	4.57
3	4.56	6.60	5.74	6.92	7.08	7.12	6.90	5.40	4.60	4.74	4.50	4.58
4	4.58	6.85	6.55	6.85	7.30	7.55	6.85	5.36	4.59	4.64	4.50	4.60
5	4.52	6.38	6.15	7.35	7.38	.....	6.88	5.32	4.55	4.62	4.50	4.60
6	4.58	6.22	6.10	7.10	7.20	.....	6.80	5.36	.....	4.61	4.50	4.63
7	4.52	6.10	6.30	6.95	7.28	7.75	6.78	5.28	4.53	4.59	4.50	4.65
8	4.55	6.02	8.75	6.85	7.50	7.90	6.70	5.24	4.52	4.56	4.50	4.64
9	4.58	5.95	7.55	6.82	7.20	7.50	6.60	5.21	4.51	4.58	4.50	4.61
10	6.45	5.94	8.25	6.78	7.30	7.75	6.62	5.20	4.51	4.55	4.61	4.60
11	5.30	5.95	7.20	6.68	.....	8.15	6.48	5.16	4.51	.....	4.96	4.60
12	5.08	5.84	6.90	6.55	7.32	8.15	6.50	5.12	4.54	.....	4.66	4.60
13	5.01	6.18	6.62	6.60	7.30	8.20	6.45	5.08	4.55	.....	4.62	4.60
14	4.99	6.22	6.57	6.48	7.30	8.15	6.42	5.05	4.53	4.52	4.58	4.60
15	5.24	5.94	6.62	6.54	7.05	7.80	6.62	5.02	4.50	4.53	4.64	4.60
16	5.20	5.85	6.55	6.58	6.90	7.85	6.54	4.98	4.50	4.52	4.71	4.60
17	5.02	5.82	6.52	6.68	6.92	8.00	6.58	4.95	4.50	4.50	4.62	4.69
18	4.98	5.82	6.55	6.78	7.00	7.90	6.60	4.92	4.50	4.50	4.58	4.65
19	4.92	5.82	6.55	6.90	7.30	7.75	6.40	4.89	4.46	4.50	4.60	4.60
20	4.92	5.79	6.52	6.92	7.48	7.60	6.21	4.88	4.44	4.50	4.60	4.60
21	6.28	5.70	6.60	6.92	7.62	7.50	6.10	4.83	4.46	4.50	4.60	4.62
22	5.64	5.70	6.59	7.00	7.85	7.40	6.05	4.78	4.56	4.49	4.60	.....
23	5.41	5.70	6.48	7.10	8.30	7.28	5.98	4.78	4.68	4.49	4.55	4.65
24	5.55	5.74	6.55	7.15	.....	7.08	5.96	4.74	4.60	4.49	4.55	4.62
25	7.10	5.68	6.55	7.15	7.55	7.02	5.88	4.71	4.50	4.49	4.55	4.58
26	6.29	5.68	6.56	7.20	7.15	7.20	5.78	4.68	4.57	4.49	4.55	4.60
27	5.82	5.60	6.55	7.15	7.15	7.20	5.72	4.65	4.56	.....	4.55	4.65
28	5.70	5.61	6.62	6.95	7.30	7.15	5.68	4.64	4.54	.....	4.55	4.72
29	10.00	.....	6.74	6.79	7.25	7.10	5.56	4.64	4.49	4.50	4.55	4.70
30	9.05	.....	6.82	6.82	7.15	6.98	5.60	4.61	4.94	4.50	4.56	4.68
31	9.70	.....	6.92	.....	7.00	.....	5.58	4.60	.....	4.50	.....	4.68

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Daily discharge, in second-feet, of Kaweah River near Three Rivers, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	68	1,920	391	1,390	1,290	1,300	1,270	362	86	113	70	81
2	77	1,250	391	1,280	1,290	1,220	1,220	318	86	101	70	81
3	73	1,000	445	1,290	1,450	1,500	1,270	303	86	113	70	88
4	77	1,220	960	1,220	1,700	2,020	1,220	289	84	96	70	86
5	66	831	678	1,760	1,800	2,110	1,250	275	78	90	70	86
6	77	723	649	1,480	1,580	2,210	1,180	289	76	88	70	92
7	66	645	775	1,320	1,680	2,300	1,160	261	75	84	70	96
8	72	597	4,000	1,220	1,950	2,530	1,080	248	73	80	70	94
9	77	555	2,020	1,190	1,580	1,950	1,060	238	72	83	70	88
10	1,010	549	3,120	1,160	1,700	2,300	1,020	235	72	78	88	86
11	271	555	1,580	1,070	1,710	2,940	905	223	72	77	166	86
12	196	494	1,270	960	1,720	2,940	920	210	76	76	97	86
13	176	697	1,020	1,000	1,700	3,030	882	198	78	74	90	86
14	170	723	976	905	1,700	2,940	860	190	75	73	83	86
15	249	549	1,020	952	1,420	2,370	1,020	182	70	75	94	86
16	235	499	960	984	1,270	2,450	952	171	70	73	107	86
17	179	483	936	1,070	1,290	2,690	984	163	70	70	90	103
18	168	483	960	1,160	1,370	2,530	1,000	155	70	70	83	96
19	151	483	960	1,270	1,700	2,300	845	148	64	70	86	86
20	151	468	936	1,290	1,920	2,080	716	145	62	70	86	86
21	353	426	1,000	1,290	2,110	1,950	645	133	64	70	86	90
22	419	426	992	1,370	2,450	1,820	615	122	80	69	96	93
23	314	426	905	1,480	3,200	1,680	573	122	101	69	78	96
24	1,100	445	960	1,530	2,610	1,450	561	113	86	69	78	90
25	1,720	417	960	1,530	2,020	1,390	515	107	70	69	78	83
26	862	417	968	1,580	1,530	1,580	464	101	81	69	78	86
27	520	382	960	1,530	1,530	1,580	435	96	80	69	78	96
28	449	386	1,020	1,320	1,700	1,530	417	94	76	70	78	109
29	6,610	.....	1,120	1,170	1,640	1,480	366	94	69	70	78	105
30	4,560	.....	1,190	1,190	1,530	1,350	382	88	160	70	80	101
31	5,920	.....	1,290	.....	1,370	.....	374	86	.....	70	.....	101

NOTE.—Daily discharge determined from two fairly well defined rating curves, applicable Jan. 1–28 and Jan. 29 to Dec. 31. Discharge interpolated for days on which gage was not read.

Monthly discharge of Kaweah River near Three Rivers, Cal., for 1911.

[Drainage area, 520 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	6,610	66	869	1.67	1.92	53,400	B.
February	1,920	382	645	1.24	1.29	35,800	B.
March	4,000	391	1,140	2.19	2.52	70,100	B.
April	1,760	905	1,270	2.44	2.72	75,600	B.
May	3,200	1,270	1,730	3.33	3.84	106,000	B.
June	3,030	1,220	2,050	3.94	4.40	122,000	B.
July	1,270	366	842	1.62	1.87	51,800	B.
August	362	86	186	.358	.41	11,400	B.
September	160	62	78.7	.151	.17	4,680	B.
October	113	69	78.0	.150	.17	4,800	B.
November	166	70	83.3	.160	.18	4,960	B.
December	109	81	90.6	.174	.20	5,570	B.
The year	6,610	62	754	1.45	19.69	546,000	

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NORTH FORK OF KAWEAH RIVER AT KAWEAH, CAL.

Location.—At highway bridge in the SW. ¼ sec. 2, T. 17 S., R. 28 E., Sequoia National Forest, about half a mile north of Kaweah and 2 miles above junction with Kaweah River.

Records available.—October 12, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to right abutment of bridge.

Channel.—Solid rock and sand and fairly permanent.

Discharge measurements.—Made from bridge at gage and by wading.

Diversions.—Approximately 20 second-feet is diverted by several small ditches for irrigation above the station.

Accuracy.—Results are good at low stages; publication of discharge is withheld until confirmatory measurements can be secured for high stages.

Cooperation.—Previous to October 1, 1911, gage-height record was furnished by United States Forest Service. Discharge measurements also furnished by the Forest Service in 1911.

Discharge measurements of North Fork of Kaweah River at Kaweah, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 27	H. J. Tompkins	1.82	151
29	....do	5.00	2,000
29	....do	5.20	[b]2,060
29	....do	5.55	[b]2,540
30	....do	4.20	1,510
Feb. 1	....do	3.00	729
Mar. 10	Tompkins and Purdy	3.65	1,120
11	H. J. Tomkpins	2.96	675
12	....do	2.68	499
May 19	....do	2.45	344
Sept. 17[a]	....do	.60	7.0

[a] By wading 2 miles below gage. [b] Measurement very unreliable.

NOTE.—All measurements above 600 second-feet liable to considerable error.

Daily gage height, in feet, of North Fork of Kaweah River at Kaweah, Cal., for 1911.

[G. W. Purdy and L. Weckert, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.0	.....	2.7	2.4	2.2	1.5	0.9	0.6	0.7	0.7	0.8
2	0.74	.....	.....	2.6	2.45	2.1	1.55	.9	.6	.....	.7	.8
3	.75	.....	1.75	2.7	2.45	2.1	1.45	.85	.6	.....	.7	.8
4	.78	.....	.....	.....	2.55	2.1	1.5	.85	.6	.....	.7	.8
5	.....	.....	2.8	2.9	2.7	2.3	1.4	.85	.6	.....	.7	.8
6	.79	.....	.....	2.85	2.55	2.2	.....	.85	.6	.....	.7	.8
7	.78	.....	2.35	2.7	2.55	2.2	.....	.85	.6	.....	.7	.8
8	.....	.....	4.1	2.6	.....	2.2	.....	.85	.6	.....	.7	.85
9	.83	.....	3.1	2.55	2.55	.....	1.3	.85	.6	.....	.7	.9
10	1.92	.....	3.65	2.5	2.5	.....	1.3	.85	.6	.....	.95	.85
11	1.30	.....	3.0	2.4	2.5	.....	1.25	.85	.6	.....	1.12	.85
12	1.22	.....	2.7	2.4	2.5	2.1	1.25	.8	.6	.....	.9	.8
13	1.15	.....	2.5	2.35	2.5	2.1	1.2	.8	.6	.....	.85	.85
14	1.12	2.00	2.45	2.35	2.4	.....	1.2	.8	.6	.....	.85	.85
15	1.55	.....	.....	2.3	2.3	.....	1.15	.75	.6	.7	.85	.9
16	1.35	.....	.....	2.35	.....	.....	1.1	.75	.6	.7	.85	.9
17	.....	.....	2.5	2.45	.....	2.0	1.1	.75	.6	.7	.85	.9
18	.....	1.80	2.45	2.5	.....	1.95	1.1	.7	.6	.7	.8	.9
19	.....	1.80	2.35	2.55	2.45	.....	1.2	.7	.6	.7	.8	.9
20	.....	1.80	2.4	2.5	2.4	1.9	1.15	.7	.6	.7	.8	.9

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Daily gage height, in feet, of North Fork of Kaweah River at Kaweah, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	.....	.....	2.45	2.5	2.5	.....	1.1	0.7	0.6	0.65	0.8	0.9
22	.....	.....	2.35	.....	2.5	.....	1.1	.7	.6	.65	.8	.9
23	.....	.....	2.4	2.55	2.5	.....	1.1	.7	.7	.65	.75	.9
24	2.59	1.72	2.4	2.75	2.5	.....	1.1	.7	.7	.65	.75	.85
25	2.85	.....	2.45	2.7	.....	.....	1.05	.7	.7	.65	.8	.85
26	2.28	.....	2.35	2.7	.....	1.7	1.05	.7	.7	.65	.8	.85
27	1.78	1.60	2.45	2.7	2.2	1.68	1.0	.7	.7	.65	.8	.85
28	1.72	.....	2.5	2.5	2.2	1.58	1.0	.65	.7	.65	.8	.95
29	4.85	.....	2.48	2.4	2.2	1.6	1.0	.65	.7	.65	.8	.95
30	4.29	.....	2.6	2.4	2.0	1.55	.95	.65	.7	.7	.8	.9
31	4.88	.....	2.6	.....	.....	.....	.9	.65	.....	.7	.....	.9

SOUTH FORK OF KAWEAH RIVER NEAR THREE RIVERS, CAL.

Location.—On the Mehrton ranch, in the SE. ¼ sec. 8, T. 18 S., R. 29 E., 500 feet above mouth of Cinnamon Creek, and 4½ miles southeast of Three Rivers, about 5 miles above junction with Keweah River.

Records available.—September 18 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to large bowlder on right bank.

Channel.—Gravel and bowlders; rough.

Discharge measurements.—Car and cable were installed in November, 1911. Low-water measurements are made by wading.

Diversions.—Two small ditches divert water for irrigation above the station.

Discharge measurements of South Fork of Kaweah River near Three Rivers, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 19[a]	H. J. Tompkins	2.00	4.6
Nov. 23[b]	.....do	2.10	12

[a] Made by wading at gage. [b] Made by wading 300 feet above gage.

Daily gage height, in feet, of South Fork of Kaweah River near Three Rivers, Cal., for 1911.

[David N. Mehrten, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	2.1	2.0	2.1	16	.....	2.0	2.15	2.2
2	.....	2.1	2.0	2.1	17	.....	2.0	2.1	2.3
3	.....	2.1	2.0	2.1	18	.....	2.0	2.1	2.1
4	.....	2.1	2.1	2.15	19	1.95	2.0	2.1	2.15
5	.....	2.1	2.1	2.2	20	2.0	2.0	2.1	2.15
6	.....	2.1	2.1	2.15	21	2.1	2.0	2.1	2.15
7	.....	2.05	2.05	2.15	22	2.0	2.0	2.1	2.15
8	.....	2.05	2.1	2.1	23	2.0	2.0	2.1	2.25
9	.....	2.15	2.2	2.1	24	2.0	2.0	2.1	2.2
10	.....	2.1	2.4	2.1	25	2.0	2.0	2.1	2.1
11	.....	2.1	2.2	2.1	26	2.0	2.0	2.1	2.1
12	.....	2.05	2.15	2.1	27	2.0	2.05	2.1	2.1
13	.....	2.05	2.1	2.2	28	2.0	2.05	2.1	2.25
14	.....	2.0	2.1	2.2	29	2.1	2.05	2.1	2.15
15	.....	2.0	2.1	2.2	30	2.2	2.1	2.1	2.1
					31	.....	2.1	.....	2.1

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KINGS RIVER NEAR SANGER, CAL.

Location.—About half a mile below new highway bridge at Piecha, near mouth of canyon, in the NW. ¼ sec. 8, T. 13 S., R. 24 E., southwest of Red Mountain, and about 12 miles northeast of Sanger.

Records available.—September 3, 1895, to December 31, 1911.

Drainage area.—1,740 square miles.

Gage.—Friez improved automatic water-stage register on right bank. Auxiliary staff gage in two sections located just above automatic register.

Channel.—Gravel and small bowlders; shifts but slightly.

Discharge measurements.—Made from car and cable 500 feet below gage or by wading.

Diversions.—Several miles above the station there is a small diversion for a flume used to float lumber to Sanger.

Accuracy.—Results are good.

Discharge measurements of Kings River near Sanger, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 20	J. E. Stewart	6.09	1,630
May 16	....do	9.28	6,250
June 10	W. V. Hardy	11.50	12,200
13	H. J. Tompkins	12.30	14,700
16	W. V. Hardy	12.25	15,400
Sept. 13	J. E. Stewart	4.80	562

Daily gage height, in feet, of Kings River near Sanger, Cal., for 1911.

[O. G. Williams, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.3	10.4	5.8	8.65	8.95	9.45	10.65	7.3	5.15	5.1	4.45	4.4
2	4.25	9.35	5.9	8.75	9.0	9.7	10.8	7.2	5.1	5.0	4.45	4.4
3	4.25	8.65	6.2	8.9	9.4	10.45	10.95	7.05	5.1	4.9	4.45	4.4
4	4.3	8.6	8.35	8.65	9.9	11.15	10.95	6.85	5.1	4.85	4.45	4.45
5	4.3	7.85	7.75	9.15	10.45	11.45	10.95	6.8	5.05	4.8	4.4	4.45
6	4.3	7.35	7.25	9.5	9.75	11.75	10.85	6.75	5.0	4.75	4.4	4.45
7	4.3	7.05	8.6	8.95	9.8	11.35	10.95	6.6	4.95	4.75	4.4	4.55
8	4.3	6.75	11.65	8.6	10.0	11.25	10.85	6.5	4.9	4.7	4.4	4.55
9	4.3	6.5	9.9	8.5	10.05	11.35	10.5	6.4	4.85	4.65	4.4	4.5
10	6.15	6.35	10.7	8.4	9.8	11.7	10.5	6.35	4.85	4.7	4.5	4.45
11	5.2	6.3	9.4	8.1	9.85	12.15	10.1	6.25	4.85	4.7	4.85	4.45
12	4.85	6.35	8.7	7.95	10.15	12.4	10.2	6.15	4.8	4.65	4.5	4.4
13	5.2	6.4	8.3	7.8	10.25	12.5	10.2	6.1	4.75	4.6	4.55	4.35
14	5.1	7.05	7.95	7.65	10.1	12.05	10.25	5.95	4.75	4.6	4.6	4.35
15	5.6	6.55	8.85	7.6	9.6	12.1	10.35	5.9	4.7	4.55	4.55	4.35
16	5.35	6.3	7.7	7.8	9.3	12.35	10.1	5.8	4.65	4.55	4.6	4.35
17	4.95	6.1	7.65	7.95	9.35	12.5	11.1	5.75	4.65	4.55	4.6	4.4
18	4.9	6.0	7.65	8.15	9.7	12.65	10.6	5.7	4.65	4.5	4.55	4.4
19	4.85	6.0	7.7	8.55	10.4	12.35	10.5	5.7	4.65	4.5	4.55	4.35
20	4.85	6.1	7.65	8.7	10.8	12.05	9.85	5.65	4.6	4.5	4.55	4.35
21	6.55	6.0	7.7	8.65	11.0	12.1	9.4	5.6	4.6	4.5	4.55	4.4
22	5.9	5.95	7.6	8.8	11.4	11.75	9.1	5.6	4.9	4.45	4.5	4.3
23	5.5	5.95	7.55	9.15	11.85	11.5	8.9	5.5	5.6	4.45	4.5	4.35
24	7.75	5.95	7.6	9.45	11.6	10.95	8.7	5.5	5.2	4.45	4.45	4.4
25	9.35	5.85	7.65	9.65	10.8	10.75	8.5	5.4	5.05	4.45	4.45	4.3
26	7.5	5.75	7.7	9.8	10.15	11.2	8.25	5.4	4.95	4.45	4.45	4.25
27	6.35	5.85	7.75	9.5	10.05	11.55	8.0	5.3	4.85	4.45	4.45	4.25
28	6.0	5.8	7.85	9.15	10.3	11.55	7.85	5.3	4.75	4.45	4.45	4.5
29	10.25	.....	7.95	8.85	10.15	11.25	7.65	5.25	4.75	4.45	4.4	4.5
30	12.7	.....	8.1	8.8	9.9	10.95	7.55	5.2	5.1	4.45	4.4	4.4
31	13.7	.....	8.35	.....	9.65	.....	7.35	5.15	.....	4.45	.....	4.35

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Daily discharge, in second-feet, of Kings River near Sanger, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	296	9,030	1,360	5,140	5,700	6,730	9,720	3,030	814	778	375	348
2	270	6,520	1,450	5,320	5,800	7,290	10,200	2,900	778	708	375	348
3	270	5,140	1,750	5,610	6,620	9,160	10,600	2,710	778	642	375	348
4	296	5,050	4,600	5,140	7,760	11,200	10,600	2,470	778	610	375	375
5	296	3,800	3,660	6,100	9,160	12,200	10,680	2,410	743	578	348	375
6	296	3,100	2,960	6,840	7,400	13,200	10,300	2,360	708	548	348	375
7	296	2,710	5,050	5,700	7,520	11,900	10,600	2,190	675	548	348	430
8	296	2,360	12,800	5,050	8,000	11,500	10,300	2,080	642	517	348	430
9	296	2,080	7,760	4,870	8,120	11,900	9,300	1,970	610	488	348	402
10	1,700	1,920	9,860	4,690	7,520	13,000	9,300	1,920	610	517	402	375
11	851	1,860	6,620	4,190	7,640	14,600	8,250	1,860	610	517	610	375
12	610	1,920	5,230	3,960	8,380	15,500	8,500	1,700	578	488	402	348
13	851	1,970	4,520	3,730	8,630	15,800	8,500	1,650	548	458	430	322
14	778	2,710	3,960	3,510	8,250	14,200	8,630	1,500	548	458	458	322
15	1,180	2,140	5,520	3,440	7,060	14,400	8,900	1,450	517	430	430	322
16	966	1,860	3,580	3,730	6,410	15,300	8,250	1,360	488	430	458	322
17	675	1,650	3,510	3,960	6,520	15,800	11,100	1,310	488	430	458	348
18	642	1,550	3,510	4,270	7,290	16,400	9,580	1,270	488	402	430	348
19	610	1,550	3,580	4,960	9,030	15,300	9,300	1,270	488	402	430	322
20	610	1,650	3,510	5,230	10,200	14,200	7,640	1,220	458	402	430	322
21	2,140	1,550	3,580	5,140	10,800	14,400	6,620	1,180	458	402	430	348
22	1,450	1,500	3,440	5,420	12,000	13,200	6,000	1,180	642	375	402	296
23	1,090	1,500	3,370	6,100	13,500	12,400	5,610	1,090	1,180	375	402	322
24	3,660	1,500	3,440	6,730	12,700	10,600	5,230	1,090	851	375	375	348
25	6,520	1,410	3,510	7,180	10,200	10,000	4,870	1,010	743	375	375	296
26	3,300	1,310	3,580	7,520	8,380	11,400	4,440	1,010	675	375	375	270
27	1,920	1,410	3,660	6,840	8,120	12,500	4,030	926	610	375	375	270
28	1,550	1,360	3,800	6,100	8,760	12,500	3,800	926	548	375	375	402
29	8,630	.....	3,960	5,520	8,380	11,500	3,510	888	548	375	348	402
30	16,600	.....	4,190	5,420	7,760	10,600	3,370	851	778	375	348	348
31	20,500	.....	4,600	.....	7,180	.....	3,100	814	.....	375	.....	322

NOTE.—Daily discharge determined from a well-defined rating curve.

Monthly discharge of Kings River near Sanger, Cal., for 1911.

[Drainage area, 1,740 square miles.]

Month.	Discharge in second feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	20,500	270	2,560	1.47	1.70	157,000	A.
February	9,030	1,310	2,580	1.48	1.54	143,000	A.
March	12,800	1,360	4,380	2.52	2.90	269,000	A.
April	7,520	3,440	5,280	3.02	3.37	312,000	A.
May	13,500	5,700	8,410	4.83	5.57	517,000	A.
June	16,400	6,730	12,600	7.24	8.08	750,000	A.
July	11,100	3,100	7,770	4.47	5.15	478,000	A.
August	3,030	814	1,600	.920	1.06	98,400	A.
September	1,180	458	646	.371	.41	38,400	A.
October	778	375	468	.269	.31	28,800	A.
November	610	348	399	.229	.26	23,700	B.
December	430	270	348	.200	.23	21,400	B.
The year	20,500	270	3,920	2.25	30.58	2,840,000	

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DINKEY CREEK NEAR OCKENDEN, CAL.

Location.—Above trail bridge at Dinkey Creek ranger station, in the NE. ¼ sec. 20, T. 10 S., R. 26 E., in the Sierra National Forest, about 11 miles above junction with North Fork of Kings River and about 9½ miles southeast of Ockenden. Rock Creek enters 3 miles above and Bear Creek 1½ mile sbelow the station.

Records available.—September 17, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank about 400 feet below forest ranger's station.

Channel.—Gravel and small bowlders and appears permanent.

Discharge measurements.—Made from car and cable installed in October, 1911. Low-water measurements made by wading.

Cooperation.—Gage height record and discharge measurements furnished by United States Forest Service. This station is only maintained during the summer months.

Estimates are withheld until additional measurements can be made.

Discharge measurements of Dinkey Creek near Ockenden, Cal., for 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 11	H. J. Tompkins	2.90	736
Sept. 22	.....do	.80	31

Daily gage height, in feet, of Dinkey Creek near Ockenden, Cal., for 1911.

[Roy Boothe and Frank Price, observers.]

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1	.....	.....	2.35	0.9	0.5	16	.....	3.25	1.75	0.7	0.4
2	.....	.....	2.4	.8	.5	17	.....	3.3	1.9	.6	.....
3	.....	.....	2.5	.8	.5	18	.....	2.1	1.8	.6	.....
4	.....	.....	2.4	.8	.5	19	.....	3.05	1.55	.6	.4
5	.....	.....	2.3	.8	.5	20	.....	3.15	1.5	.6	.....
6	.....	.....	2.35	.75	.5	21	.....	2.9	1.35	.6	.4
7	.....	.....	2.25	.7	.5	22	.....	2.8	1.25	.6	1.0
8	.....	3.2	2.1	.7	.5	23	.....	2.55	1.2	.5	.....
9	.....	3.0	2.05	.7	.4	24	.....	2.35	1.15	.5	.5
10	.....	3.15	1.95	.7	.4	25	.....	2.35	1.15	.5	.....
11	.....	3.2	1.95	.7	.4	26	.....	2.65	1.05	.5	.5
12	.....	3.25	1.85	.7	.....	27	.....	2.65	1.0	.5	.....
13	.....	3.3	1.85	.7	.4	28	2.8	2.5	.95	.5	.5
14	.....	3.2	1.85	.7	.....	29	2.5	2.5	.9	.5	.5
15	.....	3.15	1.75	.7	.....	30	.....	2.4	.85	.5	.5
						31	.....	.....	.85	.5	.....

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BIG CREEK NEAR TOLLHOUSE, CAL.

Location.—At Hawk's mine, in the SW. ¼ sec. 27, T. 10 S., R. 25 E., in Sierra National Forest, 3½ miles above junction with Kings River, and about 9 miles east of Tollhouse.

Records available.—March 21 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections on left bank near observer's cabin.

Channel.—Bowlders and solid rock; appears permanent.

Discharge measurements.—Made by wading.

Diversions.—Two small ditches above the station. One is used to operate a small stamp mill and the water is returned below the gage. The other ditch is used for irrigation.

Cooperation.—Gage-height record furnished by Ira F. Hawk. Discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

Discharge measurements of Big Creek near Tollhouse, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 21	H. J. Tompkins	2.60	122
June 10	do	.20	28
Sept. 23	do	−1.30	2.4

Daily gage height, in feet, of Big Creek near Tollhouse, Cal., for 1911.

[Ira F. Hawk, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.6	1.8	.8	−0.5	−1.1	−1.3	−1.3	−1.3	−1.2
2	.....	2.5	1.8	.7	− .5	−1.1	−1.3	−1.3	−1.3	−1.2
3	.....	2.5	1.8	.7	− .6	−1.1	−1.3	−1.3	−1.3	−1.2
4	.....	2.3	1.9	.5	− .6	−1.1	−1.3	−1.3	−1.3	−1.2
5	.....	3.5	2.0	.6	− .6	−1.2	−1.3	−1.3	−1.3	−1.2
6	.....	4.5	1.7	.5	− .7	−1.2	−1.3	−1.3	−1.3	−1.1
7	.....	2.8	1.8	.5	− .7	−1.2	−1.3	−1.3	−1.3	−1.2
8	.....	2.7	1.7	.4	− .7	−1.2	−1.3	−1.3	−1.3	−1.2
9	.....	2.6	1.7	.3	− .7	1.2	−1.3	−1.3	−1.2	−1.2
10	.....	2.6	1.6	.3	− .7	−1.2	−1.3	−1.3	−1.0	−1.2
11	.....	2.4	1.5	.2	− .7	−1.2	−1.3	−1.3	−1.1	−1.2
12	.....	2.3	1.5	.1	− .7	−1.2	−1.3	−1.3	−1.1	−1.2
13	.....	2.2	.....	.0	− .8	−1.2	−1.3	−1.3	−1.1	−1.2
14	.....	2.0	.....	.0	− .8	−1.2	−1.3	−1.3	−1.2	−1.2
15	.....	2.1	.....	.0	− .8	−1.2	−1.3	−1.3	−1.2	−1.2
16	.....	2.1	.....	.0	− .9	−1.2	−1.3	−1.3	−1.1	−1.2
17	.....	2.2	1.3	.0	− .9	−1.2	−1.3	−1.3	−1.2	−1.2
18	.....	2.3	1.2	−.1	− .9	−1.2	−1.3	−1.3	−1.2	−1.2
19	.....	2.4	1.3	−.2	− .9	−1.2	−1.3	−1.3	−1.2	−1.2
20	.....	2.4	1.3	−.2	− .9	−1.2	−1.3	−1.3	−1.2	−1.2
21	2.6	2.2	1.2	−.3	−1.0	−1.2	−1.3	−1.3	−1.2	−1.2
22	2.6	2.2	1.3	−.3	−1.0	−1.2	−1.3	−1.3	−1.2	−1.2
23	2.5	2.2	1.3	−.3	−1.0	−1.3	−1.3	−1.3	−1.2	−1.2
24	2.4	2.2	1.2	−.3	−1.0	−1.3	−1.3	−1.3	−1.2	−1.2
25	2.4	2.3	1.0	−.3	−1.0	−1.3	−1.3	−1.3	−1.2	−1.2
26	2.4	2.4	1.0	−.3	−1.1	−1.3	−1.3	−1.3	−1.2	−1.2
27	2.3	2.4	.9	−.3	−1.1	−1.3	−1.3	−1.3	−1.2	−1.2
28	2.3	2.0	.8	−.4	−1.1	−1.3	−1.3	−1.3	−1.2	.....
29	2.4	1.8	.8	−.4	−1.1	−1.3	−1.3	−1.3	−1.2	− .8
30	2.4	1.6	.9	−.5	−1.1	−1.3	−1.3	−1.3	−1.2	− .8
31	2.4	.....	.9	.....	−1.1	−1.3	.....	−1.3	.....	− .8

NOTE.—Gage heights affected by ice during the latter part of December.

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RUSH CREEK NEAR OCKENDEN, CAL.

Location.—Above highway bridge at Peterson's mill, in the SW. ¼ sec. 19, T. 10 S., R. 25 E., in the Sierra National Forest, 6 miles above junction with Big Creek, and about 3 miles southeast of Ockenden. Taylor Creek enters 1 mile above the gage.

Records available.—September 22, 1910 to January 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a cedar tree on right bank 200 feet above highway bridge. Gage washed out February 1, 1911 and replaced at a different datum June 10, 1911.

Channel.—Sand and will shift at high water.

Discharge measurements.—Made from highway bridge 200 feet below gage or by wading.

Cooperation.—Gage height record furnished by C. G. Peterson. Discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements have been made.

Discharge measurements of Rush Creek near Ockenden, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 10	H. J. Tompkins	1.05	8.6
Mar. 20	do	(a)	65
June 10	do	b2.25	10
Sept. 23c	do	b1.85	1.3

a Gage gone.
b Referenced to new datum.
c Measurement made from plank 40 feet below gage.

Daily gage height, in feet, of Rush Creek near Ockenden, Cal., for 1911.

[C. G. Peterson, observer.]

Day.	Jan.	Day.	Jan.	Day.	Jan.	Day.	Jan.	Day.	Jan.	Day.	Jan.
1	0.52	6	0.48	11	0.95	16	1.15	21	1.35	26	1.65
2	.52	7	.47	12	.92	17	.95	22	1.20	27	1.25
3	.50	8	.47	13	.95	18	.95	23	.95	28	1.7
4	.50	9	1.44	14	.95	19	.85	24	3.10	29	3.75
5	.48	10	1.20	15	1.75	20	1.85	25	3.65	30	3.88
										31	4.75

FRESNO RIVER NEAR KNOWLES, CAL.

Location.—At Fresno Crossing, in the N. ½ sec. 15, T. 8 S., R. 20 E., about 6 miles northeast of Knowles.

Records available.—September 16 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to willow tree on left bank, about 100 feet above highway bridge.

Channel.—Small bowlders, gravel, and sand, and fairly permanent.

Discharge measurements.—Made from car and cable about 400 feet below gage and by wading.

Diversions.—Water is diverted above the station for irrigation and for use in lumbering.

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Discharge measurements of Fresno River near Knowles, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 16[a]	J. E. Stewart	0.50	15
Nov. 10[b]	H. J. Tompkins	.62	25

[a] Made by wading 150 feet above the gage. [b] Made by wading 200 feet above the gage.

Daily gage height, in feet, of Fresno River near Knowles, Cal., for 1911.

[J. E. Gayman, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1		0.60	0.50	0.58	16	0.50	0.55	0.60	0.58
2		.60	.50	.58	17	.50	.55	.68	.62
3		.57	.50	.60	18	.51	.50	.65	.60
4		.60	.50	.58	19	.50	.50	.63	.60
5		.57	.50	.58	20	.45	.50	.62	.65
6		.58	.50	.57	21	.45	.50	.65	.70
7		.55	.55	.65	22	.47	.48	.65	.60
8		.52	.55	.65	23	.50	.50	.63	.60
9		.50	.55	.62	24	.50	.50	.65	.60
10		.55	.60	.60	25	.50	.50	.60	.60
11		.60	.90	.60	26	.57	.50	.60	.50
12		.58	.70	.58	27	.55	.52	.60	.80
13		.55	.70	.55	28	.60	.52	.60	.82
14		.55	.68	.55	29	.52	.50	.60	.70
15		.52	.60	.57	30	.55	.50	.58	.65
					31		.50		.75

NELDER CREEK [1] NEAR FRESNO FLATS, CAL.

Location.—Above highway bridge on Salt Springs and Crane Valley road, in the SE. ¼ sec. 36, T. 6 S., R. 21 E., in the Sierra National Forest, just above intake of flume feeder for Madera Sugar Pine Co.'s flume, and about 4 miles northeast of Fresno Flats.

Records available.—September 23, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on left bank 400 feet above bridge.

Channel.—Gravel and sand, and will shift at high water.

Discharge measurements.—Made by wading. No measurements were made during 1911.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

[1] Formerly published as Fresno River near Fresno Flats. See map of Mariposa quadrangle, published July, 1912.

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Daily gage height, in feet, of Nelder Creek near Fresno Flats, Cal., for 1911.

[W. M. Brown, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1				2.0			16	1.0					
2					1.5		17			1.8			
3	0.6						18						
4							19	0.8					
5							20		1.4	1.8		1.3	
6		1.6			1.6		21						1.5
7			4.1				22		1.4		1.7		
8				2.0			23	1.0					1.6
9							24		1.4				
10	1.2					1.7	25	3.0					
11			2.1				26	1.8			1.7		
12					1.4		27		1.6	1.8		1.1	
13			1.8		1.4		28				1.6		
14	1.1						29				1.5		
15		1.5		1.7			30	5.7					
							31	4.5		1.9			

NORTH FORK OF FRESNO RIVER [1] NEAR SUGAR PINE, CAL.

Location.—At Miami Creek ranger station, in Sierra National Forest, 3 miles southwest of Sugar Pine.

Records available.—September 26, 1910, to September 30, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on left bank, 200 feet north of forest ranger's station.

Channel.—Sand and bowlders.

Discharge measurements.—Made by wading. No measurements were made during 1911.

Cooperation.—Gage-height record and discharge measurements furnished by the United States Forest Service.

Estimates are withheld until additional measurements are available.

Daily gage height, in feet, of North Fork of Fresno River near Sugar Pine, Cal., for 1911.

[M. McLeod, observer.]

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1			0.7	0.7	16				0.6
2			.7	.7	17			0.7	
3			.7	.7	18			.7	.6
4			.7	.7	19				
5			.7	.7	20				.6
6			.7	.7	21				.6
7			.7	.7	22				.65
8			.7	.65	23			.7	.65
9			.7	.7	24		0.8	.65	.6
10			.7	.65	25		.7	.65	.6
11			.7	.6	26	0.8		.65	.6
12				.6	27		.7	.7	.6
13				.6	28	.8	.7	.7	.6
14				.6	29	.7	.7	.7	.65
15					30	.8	.7		.65
					31		.7		

[1] Known locally as Miami Creek.

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MERCED RIVER NEAR MERCED FALLS, CAL.

Location.—Near the mouth of the canyon, in the NW. ¼ sec. 11, T. 5 S., R. 15 E., 2 miles above the dam at Merced Falls.

Records available.—April 6, 1901, to December 31, 1911.

Drainage area.—1,090 square miles.

Gage.—Inclined staff in four sections on right bank and a vertical low-water section.

Channel.—Gravel, and will shift at high stages.

Discharge measurements.—Made from car and cable at gage or by wading.

Artificial control.—Flow somewhat affected by regulation for power development several miles above the station.

Accuracy.—Results for 1911 are fairly good, although there was a considerable change in channel during high water.

Discharge measurements of Merced River near Merced Falls, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 18	J. E. Stewart	10.51	1,750
May 13	do	12.54	5,120
June 13	W. V. Hardy	15.00	11,100
July 27	J. E. Stewart	10.51	1,370
Sept. 18	do	8.27	124

Daily gage height, in feet, of Merced River near Merced Falls, Cal., for 1911.

[C. Kelsey, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.45	15.05	10.8	12.2	12.05	12.4	12.55	10.15	8.85	8.55	8.35	8.42
2	8.5	13.0	12.35	12.25	12.05	12.65	12.6	10.1	8.85	8.55	8.40	8.40
3	8.45	11.8	12.35	12.4	12.25	13.3	12.8	10.0	8.80	8.65	8.30	8.40
4	8.4	11.7	14.45	12.15	12.65	13.6	12.7	9.9	8.80	8.70	8.32	8.42
5	8.4	11.25	14.45	12.8	13.2	13.8	12.7	9.9	8.75	8.55	8.35	8.40
6	8.45	10.85	13.65	12.75	12.6	14.0	12.8	9.85	8.70	8.55	8.30	8.45
7	8.45	10.5	16.5	12.2	12.25	13.8	12.75	9.7	8.70	8.55	8.35	8.60
8	8.45	10.75	16.1	12.0	12.3	13.65	12.5	9.7	8.60	8.65	8.30	8.62
9	8.6	10.55	16.05	12.0	12.5	13.55	12.15	9.7	8.60	8.55	8.32	8.51
10	10.15	10.4	16.05	12.0	12.4	13.8	12.1	9.65	8.55	8.55	8.45	8.40
11	9.25	11.0	13.8	11.8	12.55	14.25	12.25	9.6	8.50	8.51	8.80	8.45
12	9.6	10.75	12.75	11.65	12.7	14.6	12.1	9.6	8.55	8.60	8.80	8.48
13	13 2	11.3	12.1	11.55	12.55	14.65	12.1	9.5	8.60	8.45	8.50	8.40
14	11.15	11.8	11.8	11.45	12.55	14.6	12.05	9.45	8.50	8.45	8.52	8.40
15	11.4	10.95	11.65	11.4	12.25	14.35	12.1	9.35	8.45	8.65	8.48	8.38
16	10.1	10.6	11.55	11.5	11.95	14.4	13.2	9.3	8.40	8.46	8.50	8.41
17	9.45	10.4	11.55	11.6	11.9	14.5	12.4	9.25	8.35	8.42	8.70	8.42
18	9.2	10.25	11.5	11.75	11.85	14.45	12.45	9.2	8.40	8.40	8.70	8.51
19	9.1	10.3	11.6	11.95	12.3	14.4	12.0	9.2	8.38	8.32	8.50	8.46
20	9.35	10.35	11.5	12.0	12.85	14.3	11.7	9.2	8.38	8.15	8.55	8.38
21	1.13	10.15	11.55	12.0	13.25	14.25	11.4	9.2	8.36	8.30	8.62	8.32
22	10.35	10.1	11.5	12.05	13.55	13.65	11.2	9.15	8.40	8.30	8.55	8.25
23	9.55	10.0	11.5	12.35	13.95	13.3	11.1	9.1	8.45	8.25	8.50	8.27
25	13.1	10.05	11.5	12.55	13.8	12.8	11.05	9 0	8.65	8.35	8.48	8.35
25	15.75	9.9	11.5	12.75	13.3	12.5	10.95	9.0	8.82	8.30	8.45	8.35
26	11.85	9.85	11.55	12.8	12.8	13.0	10.7	9.0	8.70	8.30	8.48	8.40
27	10.85	9.85	11.6	12.45	12.9	13.4	10.55	9.0	8.65	8.30	8.45	8.29
28	10.25	9.8	11.65	12.15	13.05	13.4	10.6	8.9	8.60	8.32	8.40	8.33
29	12.9	.....	11.75	11.95	13.15	13.05	10.4	8.95	8.55	8.30	8.40	8.70
30	21.05	.....	11.85	11.9	12.8	12.85	10.3	8.9	8.50	8.30	8.41	8.52
31	20.95	.....	12.05	.....	12.55	.....	10.2	8.85	.....	8.30	.....	8.35

NOTE.—Gage heights published for Jan. 9–16, Jan. 29–Feb. 3, and Mar. 2–10 determined by means of graph.

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Daily discharge, in second-feet, of Merced River near Merced Falls, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	200	11,800	2,120	4,460	4,160	4,870	4,680	1,060	300	195	142	160
2	220	6,200	4,760	4,560	4,160	5,410	4,790	1,010	300	195	155	155
3	200	3,680	4,760	4,870	4,560	6,920	5,240	925	280	228	130	155
4	180	3,500	9,940	4,360	5,410	7,670	5,010	850	280	245	135	160
5	180	2,760	9,940	5,740	6,680	8,180	5,010	850	262	195	142	155
6	200	2,180	7,800	5,630	5,300	8,700	5,240	815	245	195	130	168
7	200	1,740	16,800	4,460	4,560	8,180	5,120	715	245	195	142	210
8	200	2,060	15,300	4,060	4,660	7,800	4,570	715	210	228	130	217
9	260	1,800	15,100	4,060	5,080	7,540	3,850	715	210	195	135	183
10	1,380	1,630	15,100	4,060	4,870	8,180	3,750	685	195	195	168	155
11	618	2,390	8,180	3,680	5,190	9,380	4,050	655	180	183	280	168
12	865	2,060	5,630	3,410	5,520	10,400	3,750	655	195	210	280	175
13	6,970	2,830	4,260	3,240	5,190	10,500	3,750	595	210	168	180	155
14	2,750	3,680	3,680	3,070	5,190	10,200	3,660	568	180	168	186	155
15	3,160	2,320	3,410	2,990	4,560	9,430	3,750	515	168	228	175	150
16	1,320	1,860	3,240	3,150	3,960	9,580	6,220	490	155	170	180	158
17	755	1,630	3,240	3,320	3,870	9,890	4,360	468	142	160	245	160
18	585	1,470	3,150	3,590	3,780	9,740	4,460	445	155	155	245	183
19	525	1,520	3,320	3,960	4,660	9,580	3,560	445	150	135	180	170
20	685	1,580	3,150	4,060	5,860	9,280	3,080	445	150	100	195	150
21	2,990	1,370	3,240	4,060	6,800	9,130	2,540	445	145	130	217	135
22	1,610	1,320	3,150	4,160	7,540	7,420	2,250	422	155	130	195	120
23	828	1,230	3,150	4,760	8,570	6,480	2,110	400	168	120	180	124
24	6,700	1,280	3,150	5,190	8,180	5,240	2,040	360	228	142	175	142
25	15,200	1,140	3,150	5,630	6,920	4,570	1,920	360	288	130	168	142
26	3,950	1,100	3,240	5,740	5,740	5,720	1,620	360	245	130	175	155
27	2,280	1,100	3,320	4,980	5,970	6,740	1,460	360	228	130	168	128
28	1,490	1,050	3,410	4,360	6,320	6,740	1,510	320	210	135	155	138
29	6,190	.....	3,590	3,960	6,560	5,840	1,300	340	195	130	155	245
30	37,200	.....	3,780	3,870	5,740	5,360	1,200	320	180	130	158	186
31	36,800	.....	4,160	.....	5,190	.....	1,100	300	.....	130	.....	142

NOTE.—Daily discharge determined from three fairly well-defined rating curves applicable Jan. 1, 1909, to Jan. 31, 1911, Feb. 1 to June 13, 1911, June 14 to Dec. 31, 1911.

Monthly discharge of Merced River near Merced Falls, Cal., for 1911.

[Drainage area, 1,090 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	37,200	180	4,410	4.05	4.67	271,000	B.
February	11,800	1,050	2,440	2.24	2.33	136,000	B.
March	16,800	2,120	5,810	5.33	6.14	357,000	A.
April	5,740	2,990	4,250	3.90	4.35	253,000	A.
May	8,570	3,780	5,510	5.06	5.83	339,000	A.
June	10,500	4,570	7,820	7.17	8.00	465,000	A.
July	6,220	1,100	3,450	3.17	3.66	212,000	B.
August	1,060	300	568	.521	.60	34,900	B.
September	300	142	208	.191	.21	12,400	B.
October	245	100	167	.153	.18	10,300	B.
November	280	130	177	.162	.18	10,500	B.
December	245	120	161	.148	.17	9,900	B.
The year	37,200	100	2,920	2.68	36.32	2,110,000	

SOUTH FORK OF MERCED RIVER NEAR WAWONA, CAL.

Location.—Opposite United States military camp in the SE. ¼ sec. 33, T. 4 S., R. 21 E., in the Sierra National Forest, 1 mile below Wawona. Big Creek enters half a mile above and Rush Creek three-fourths of a mile below the station.

Records available.—December 15, 1910 to December 31, 1911.

Drainage area.—Not measured.

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Gage.—The original gage, which was a vertical staff fastened to the center pier of the footbridge, was destroyed by high water January 30, 1911. On August 22 a new gage was installed at an independent datum. It is a vertical staff fastened to an alder tree on left bank, 250 feet below former gage.

Channel.—Gravel and bowlders.

Discharge measurements.—Made from car and cable near present gage and by wading.

Diversions.—The ranch of the Wawona Co. is irrigated from a tributary above the station.

Cooperation.—Gage height record furnished by A. C. Leonard, park ranger. Discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

Discharge measurements of South Fork of Merced River near Wawona, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 22[a]	H. J. Tompkins	2.34	47
Nov. 7[b]	do	2.10	29

[a] Made by wading about 600 feet above gage. Gage installed at new datum and location.
[b] Made by wading 400 feet below gage.

Daily gage height, in feet, of South Fork of Merced River near Wawona, Cal., for 1911.

[A. C. Leonard, observer.]

Day.	Jan.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Jan.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.5	.....	2.20	2.25	.....	2.5	16	2.8	.....	2.25	2.20	2.2	2.8
2	1.5	.....	2.22	2.28	2.2	2.6	17	2.8	.....	2.25	2.20	2.2	2.8
3	1.4	.....	2.25	2.28	2.2	2.6	18	2.8	.....	2.25	2.20	2.2	2.8
4	1.5	.....	2.25	2.25	2.2	2.6	19	2.8	.....	2.25	2.20	2.2	2.9
5	1.6	.....	2.25	2.20	2.2	2.7	20	3.0	.....	2.25	2.20	2.2	2.9
6	1.6	.....	2.25	2.20	2.2	2.7	21	2.8	.....	2.28	2.21	2.2	2.9
7	1.5	.....	2.25	2.22	2.1	2.7	22	3.0	2.34	2.50	2.20	2.2	2.9
8	1.5	.....	2.25	2.20	2.1	2.8	23	3.0	.....	2.42	2.20	2.8	2.9
9	1.7	.....	2.25	2.20	2.1	2.8	24	4.0	.....	2.40	2.20	2.7	2.9
10	2.0	.....	2.25	2.25	2.2	2.8	25	5.0	.....	2.30	2.20	2.9	3.0
11	2.7	.....	2.25	2.25	2.2	2.7	26	4.0	2.25	2.30	2.20	2.8	2.9
12	3.8	.....	2.25	2.25	2.2	2.7	27	4.1	2.22	2.28	2.20	2.8	2.9
13	3.6	.....	2.25	2.22	2.2	2.8	28	4.5	2.25	2.20	2.21	2.8	2.9
14	3.0	.....	2.25	2.22	2.2	2.8	29	5.6	2.25	2.20	2.21	2.8	3.0
15	2.8	.....	2.25	2.20	2.2	2.8	30	.....	2.25	2.20	2.21	2.7	3.0
							31	.....	2.25	.....	.....	.....	3.0

NOTE.—Gage heights for August to December referred to different datum from those in January.

BIG CREEK NEAR WAWONA, CAL.

Location.—At highway bridge on the old Madera-Yosemite toll road at Summerdale (an abandoned post office) in sec. 23, T. 5 S., R. 21 E., about 4 miles south of Wawona.

Records available.—September 25, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to downstream end of left abutment of bridge.

Channel.—Gravel and sand and shifts at high stages.

Discharge measurements.—Made from bridge at gage or by wading. No measurements made during 1911.

Winter flow.—Somewhat affected by ice.

Diversions.—Madera Sugar Pine Co. diverts water from Rush Creek several miles above the station for use in lumber flume.

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Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Daily gage height, in feet, of Big Creek near Wawona, Cal., for 1911.

[J. H. Lowery and M. McLeod, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.9	.....	.....	.....	.....	.....	16	.....	1.0	.....	.....	.....	1.8
2	1.0	1.1	.....	.....	.....	.....	17	1.5	.....	.....	.....	.....	.....
3	1.1	.....	.....	.....	.....	.....	18	.....	1.0	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....	19	1.5	.....	.....	.....	.....	.....
5	1.1	.3	.....	.....	.....	.....	20	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....	.....	21	1.3	1.0	.....	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	22	1.0	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....	.....	23	.....	1.0	.....	.....	.....	.....
9	.....	.....	.....	.....	.....	.....	24	1.0	.....	.....	.....	.....	.....
10	.4	.6	.....	.....	.....	.....	25	.....	.....	.....	.....	.....	1.0
11	.....	.....	.....	.....	.....	.....	26	.5	.....	.....	.....	.....	.....
12	.9	.....	.....	.....	.....	.....	27	.....	.....	.....	.....	.....	.....
13	.....	.7	.....	.....	.....	.....	28	.....	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	.....	1.6	29	.....	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....	1.7	30	3.5	.....	.....	.....	.....	.....
							31	2.6	.....	.....	.....	.....	.....

NOTE.—Relation between gage height and discharge slightly affected by ice for short periods during January and February

TUOLUMNE RIVER NEAR LAGRANGE, CAL.

Location.—At Lagrange dam, in the SE. ¼ sec. 17, T. 3 S., R. 14 E., about 2 miles above Lagrange.

Records available.—August 30, 1895, to December 31, 1911.

Drainage area.—1,500 square miles.

Gage.—Painted on rock ledge on right bank 80 feet above dam. Zero of gage is at average elevation of crest of dam. Previous to April 1, 1908, gage was located at highway bridge at Lagrange.

Discharge.—Computed by means of weir formula from gage heights showing depth of water on crest of curved masonry diversion dam. Coefficient was determined from current meter measurements made at highway bridge, about 2 miles below the dam, corrected to give discharge at dam. To determine the total flow of Tuolumne River at Lagrange, the flow over the dam is added to the discharge of Modesto, Turlock, and Lagrange Water & Power Co.'s canals.

Diversions.—Modesto and Turlock canals divert at dam. Lagrange Water & Power Co.'s canal heads 13 miles above the dam. The water from the power canal is returned to the river below the dam and about half a mile above the bridge.

Accuracy.—Results are excellent except at extreme low water. The combined record of river and canals is slightly affected by seepage from dam and canals.

Daily gage height, in feet, of Tuolumne River on crest of dam near Lagrange, Cal., for 1911.

[J. W. Simmons, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.45	7.00	2.25	3.95	3.22	3.55	4.00	0.80	.....	.....	.....	0.45
2	.....	4.80	2.55	4.08	3.22	3.70	4.20	.62	.....	.....	.....	.45
3	.....	3.70	3.20	4.28	3.30	4.55	4.45	.45	.....	.....	.....	.45
4	.....	3.80	5.08	3.65	3.68	5.48	4.78	.40	.....	.....	.....	.....
5	.40	3.30	4.84	4.72	4.65	5.85	4.55	.25	.....	.....	.....	.35
6	.....	2.90	4.16	4.90	3.90	6.10	4.62	.08	.....	.....	.....	.35
7	.....	2.60	7.35	3.82	3.48	5.70	4.65	.00	.....	.....	.....	.40
8	.40	2.45	7.55	3.45	3.35	5.58	4.40	.....	.....	.....	.....	.35
9	.40	2.35	5.92	3.88	3.55	5.28	3.92	.....	.....	.....	.....	.35
10	1.85	.....	6.05	3.65	3.40	5.68	3.80	.....	.....	.....	.....	.40

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Daily gage height, in feet, of Tuolumne River on crest of dam near Lagrange, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	1.10	2.50	4.30	3.05	3.58	6.40	3.80	.....	.....	0.50	.....	0.35
12	1.79	2.20	3.52	2.80	3.92	6.70	3.85	.....	.....	.....	.....	.35
13	4.05	2.65	3.00	2.52	3.72	6.92	3.88	.....	.....	.....	.....	.35
14	3.52	2.50	2.82	2.48	3.70	6.55	4.25	.....	.....	.....	0.40	.35
15	2.65	2.30	2.76	2.35	3.25	6.38	4.12	.....	.....	.....	.....	.30
16	1.85	2.15	2.25	2.48	2.82	6.70	4.28	.....	.....	.....	.....	.35
17	1.50	2.00	2.40	2.58	2.60	6.75	4.35	.....	.....	.....	.....	.35
18	1.40	1.95	2.80	2.88	2.54	6.68	4.15	.....	.....	.....	.....	.35
19	1.35	1.95	2.80	3.28	3.18	6.70	3.55	.....	.....	.....	.....	.40
20	1.44	1.95	2.80	3.32	3.75	6.58	3.10	.....	.....	.....	.....	.35
21	3.02	1.85	2.80	3.22	4.30	6.45	3.48	.....	.....	.....	.30	.30
22	2.11	1.80	2.75	3.38	4.92	5.75	2.00	.....	.....	.....	.30	.35
23	1.98	1.68	2.98	3.72	5.58	5.15	1.92	.....	.....	.....	.45	.35
24	5.16	1.58	2.90	4.02	5.62	4.20	2.15	.....	.....	.....	.35	.....
25	5.66	1.52	3.02	4.30	4.65	3.70	1.92	.....	.....	.....	.40	.20
26	3.37	1.45	3.02	4.42	3.72	4.25	1.65	.....	.....	.....	.40	.....
27	2.50	1.50	3.02	4.08	3.85	5.15	1.45	.....	.....	.....	.35	.35
28	2.10	1.42	3.15	3.40	4.15	5.62	1.32	.....	.....	.....	.30	.35
29	4.51	.....	3.28	3.02	4.15	5.08	1.20	.....	.....	.....	.30	.35
30	14.98	.....	3.52	2.95	3.95	4.00	.....	.....	.....	.....	.35	.35
31	13.90	.....	3.75	.....	3.55	.....	.95	.....	.....	.....	.....	.35

NOTE.—All water in canals and none flowing over the dam Aug. 7 to Nov. 20, except Oct. 11 and Nov. 14. Also no water over the dam Dec. 4, 24, and 26. Jan. 2–4, 6, 7, 16–19, Feb. 10, and July 30, no reading by observer. Gage heights published for Jan. 12–14, 16–19, 20–26, 29, Feb. 1, Mar. 3–6, 8–9, and Apr. 6, determined by means of hydrographs.

Daily discharge, in second-feet, of Tuolumne River passing over dam near Lagrange, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	274	16,800	3,060	7,100	5,230	6,050	7,240	648	0	0	0	274
2	263	9,510	3,690	7,460	5,230	6,440	7,800	443	0	0	0	274
3	252	6,440	5,180	8,020	5,420	8,780	8,500	274	0	0	0	274
4	240	6,700	10,400	6,310	6,390	11,600	9,450	229	0	0	0	0
5	229	5,420	9,630	9,280	9,080	12,800	8,780	115	0	0	0	189
6	229	4,470	7,690	9,810	6,970	13,600	8,990	23	0	0	0	189
7	229	3,800	18,100	6,750	5,870	12,300	9,080	0	0	0	0	229
8	229	3,480	18,800	5,800	5,540	12,000	8,360	0	0	0	0	189
9	229	3,260	13,000	6,920	6,050	11,000	7,020	0	0	0	0	189
10	2,280	3,420	13,500	6,310	5,670	12,300	6,700	0	0	0	0	229
11	1,040	3,580	8,080	4,820	6,130	14,600	6,700	0	0	320	0	189
12	2,160	2,950	5,970	4,240	7,020	15,700	6,840	0	0	0	0	189
13	7,380	3,910	4,700	3,620	6,490	16,500	6,920	0	0	0	0	189
14	5,970	3,580	4,290	3,540	6,440	15,200	7,940	0	0	0	229	189
15	3,910	3,160	4,150	3,260	5,300	14,600	7,580	0	0	0	0	149
16	2,280	2,850	3,060	3,540	4,290	15,700	8,020	0	0	0	0	189
17	1,660	2,560	3,370	3,760	3,800	15,900	8,220	0	0	0	0	189
18	1,500	2,460	4,240	4,420	3,670	15,600	7,660	0	0	0	0	189
19	1,420	2,460	4,240	5,370	5,130	15,700	6,050	0	0	0	0	229
20	1,560	2,460	4,240	5,470	6,570	15,300	4,940	0	0	0	0	189
21	4,750	2,280	4,240	5,230	8,080	14,800	5,870	0	0	0	149	149
22	2,770	2,180	4,130	5,620	9,870	12,500	2,560	0	0	0	149	189
23	2,520	1,970	4,650	6,490	12,000	10,600	2,410	0	0	0	274	189
24	10,600	1,800	4,470	7,300	12,100	7,800	2,850	0	0	0	189	0
25	12,200	1,690	4,750	8,080	9,080	6,440	2,410	0	0	0	229	81
26	5,600	1,580	4,750	8,420	6,490	7,940	1,920	0	0	0	229	0
27	3,580	1,660	4,750	7,460	6,840	10,600	1,580	0	0	0	189	189
28	2,750	1,530	5,060	5,670	7,660	12,100	1,370	0	0	0	149	189
29	8,670	.....	5,370	4,750	7,660	10,400	1,180	0	0	0	149	189
30	52,500	.....	5,970	4,580	7,100	7,240	1,010	0	0	0	189	189
31	46,900	.....	6,570	.....	6,050	.....	838	0	.....	0	.....	189

NOTE.—Daily discharge determined from a rating curve developed from current-meter discharge measurements and the weir formula $Q = 905\,b^{\frac{3}{2}}$. Jan. 2–4, 6, 7, Feb. 10, and July 30, discharge interpolated.

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Combined daily discharge, in second-feet, of Tuolumne River and three canals near Lagrange, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	334	16,900	3,420	8,470	6,820	7,720	8,900	2,290	470	188	86	340
2	323	9,570	3,890	8,830	6,830	8,120	9,480	2,050	449	204	78	340
3	312	6,500	5,380	9,410	7,010	10,500	10,200	1,860	419	232	16	338
4	300	6,760	10,600	7,680	8,000	13,300	11,100	1,800	395	263	72	64
5	289	5,480	9,840	10,600	10,700	14,500	10,500	1,680	431	247	76	254
6	289	4,530	7,900	10,700	8,580	15,300	10,700	1,580	343	230	75	255
7	289	3,860	18,200	7,920	7,490	14,000	10,800	1,500	314	219	75	295
8	289	3,540	18,900	7,030	7,160	13,700	10,000	1,370	330	206	75	255
9	289	3,320	13,200	8,260	7,680	12,700	8,550	1,360	254	200	75	255
10	2,340	3,480	13,900	7,630	7,300	14,000	8,370	1,280	271	198	75	294
11	1,100	3,640	8,460	6,130	7,780	16,300	8,380	1,190	318	530	79	189
12	2,220	3,010	6,480	5,580	8,650	17,400	8,520	1,140	249	232	72	248
13	7,440	3,970	5,300	4,950	8,140	18,200	8,600	1,050	233	173	72	189
14	6,030	3,640	4,900	4,910	8,090	16,900	9,620	1,020	200	216	301	189
15	3,970	3,220	4,910	4,620	6,940	16,300	9,260	923	205	80	72	210
16	2,340	2,910	3,920	4,880	5,930	17,400	9,700	859	202	57	72	250
17	1,720	2,620	4,350	5,120	5,450	17,600	9,900	870	193	80	72	189
18	1,560	2,520	5,220	5,790	5,320	17,300	9,340	788	193	80	72	189
19	1,480	2,520	5,220	6,770	6,800	17,400	7,720	760	182	76	72	292
20	1,620	2,520	5,220	6,890	8,230	17,000	6,610	717	174	88	72	250
21	4,810	2,340	5,220	6,670	9,740	16,500	7,550	694	172	80	221	212
22	2,830	2,240	5,060	7,100	11,500	14,200	4,230	651	202	65	222	247
23	2,580	2,150	5,750	7,970	13,700	12,300	4,010	611	178	96	347	189
24	10,700	2,110	5,580	8,780	13,800	9,450	4,520	578	200	86	262	61
25	12,300	2,040	5,870	9,570	10,700	8,100	4,070	548	211	86	302	139
26	5,660	1,930	5,870	9,920	8,140	9,610	3,590	528	238	86	302	41
27	3,640	2,010	5,870	8,980	8,490	12,300	3,240	522	223	86	255	238
28	2,810	1,880	6,230	7,220	9,330	13,800	3,010	508	204	86	215	253
29	8,730	.....	6,600	6,310	9,320	12,100	2,510	495	201	78	215	248
30	52,600	.....	7,210	6,160	8,760	8,910	2,070	483	199	78	255	252
31	47,000	.....	7,870	.....	7,700	.....	2,410	476	.....	86	.....	252

NOTE.—Assumed 60 second-feet per day in Lagrange Water & Power Co.'s canal, Jan. 1 to Apr. 21, and included in above table.

Monthly discharge of Tuolumne River passing over dam near Lagrange, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	52,500	229	6,010	370,000	A.
February	16,800	1,530	3,860	214,000	A.
March	18,800	3,060	6,580	405,000	A.
April	9,810	3,260	5,980	356,000	A.
May	12,100	3,670	6,750	415,000	A.
June	16,500	6,050	12,100	720,000	A.
July	9,450	838	5,700	350,000	A.
August	648	0	55.9	3,440	B.
September	0	0	.0	0	A.
October	320	0	10.3	633	B.
November	274	0	70.8	4,210	B.
December	274	0	177	10,900	B.
The year	52,500	0	3,930	2,850,000	

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Combined monthly discharge of Tuolumne River and three canals near Lagrange, Cal., for 1911.

[Drainage area, 1,500 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	52,600	289	6,070	4.05	4.67	373,000	A.
February	16,900	1,880	3,970	2.65	2.76	220,000	A.
March	18,900	3,420	7,300	4.87	5.62	449,000	A.
April	10,700	4,620	7,360	4.91	5.48	438,000	A.
May	13,800	5,320	8,390	5.59	6.44	516,000	A.
June	18,200	7,720	13,800	9.20	10.26	821,000	A.
July	11,100	2,070	7,340	4.89	5.64	451,000	A.
August	2,290	476	1,040	.693	.80	64,000	A.
September	470	172	262	.175	.20	15,600	B.
October	530	57	152	.101	.12	9,350	B.
November	347	16	142	.095	.11	8,450	B.
December	340	41	226	.151	.17	13,900	B.
The year	52,600	16	4,670	3.11	42.27	3,380,000	

MODESTO CANAL NEAR LAGRANGE, CAL.

Location.—Near intake at Lagrange dam, on right bank of Tuolumne River, in the SE. ¼ sec. 17, T. 3 S., R. 14 E., about 2 miles northeast of Lagrange.

Records available.—April 26, 1903 to December 31, 1911.

Gage.—Vertical iron staff in concrete well 460 feet below head gates and below waste gates. Previous to July 12, 1904, the gage was located at Indian Hill flume near Lagrange.

Discharge measurements.—Made from footbridge 550 feet below gage. This section of the canal is lined with concrete.

Accuracy.—Rating curve is well defined and results are excellent except at extreme low stages.

Discharge measurements of Modesto canal near Lagrange, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 13	J. E. Stewart	3.52	613
July 26	do	3.54	601
26	do	1.82	257
26	do	2.80	454

Daily gage height, in feet, of Modesto canal near Lagrange, Cal., for 1911.

[J. W. Simmons, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	.....	2.01	2.79	3.40	3.48	3.50	3.58	1.19	0.61	0.40
2	.....	1.20	2.79	3.38	3.50	3.58	3.60	1.15	.70	.30
3	.....	1.22	2.81	3.35	3.46	3.52	3.58	1.06	.....	.30
3	.....	1.30	2.75	3.40	3.51	3.58	3.56	1.02	.68	.30
5	.....	1.28	2.70	3.40	3.46	3.59	3.58	1.10	.70	.30
6	.....	1.25	.....	3.38	3.45	3.58	3.60	.90	.60	.30
7	.....	.....	2.78	3.40	3.46	3.52	3.46	.84	.58	.30
8	.....	.....	3.08	3.38	3.45	3.52	3.14	.90	.55	.30
9	.....	.....	3.15	3.41	3.48	3.62	2.91	.80	.....	.30
10	.....	1.70	3.10	3.38	3.48	3.58	2.72	.80	.....	.30

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Daily gage height, in feet, of Modesto canal near Lagrange, Cal., for 1911—Continued.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
11	.....	1.52	3.04	3.43	3.50	3.56	2.45	0.85	0.50	0.30
12	.....	1.52	3.15	3.35	3.48	3.56	2.30	.61	.40	.20
13	.....	1.55	3.08	3.40	3.48	3.58	2.20	.62	.40	.20
14	.....	1.65	3.29	3.41	3.46	3.58	2.10	.75	.40	.20
15	.....	1.75	3.25	3.39	3.48	3.58	2.00	.55	.40	.20
16	.....	2.25	3.15	3.41	3.48	3.55	1.85	.60	.20	.20
17	.....	2.44	3.22	3.42	3.46	3.58	1.88	.57	.30	.20
18	.....	2.50	3.28	3.43	3.52	3.54	1.75	.60	.30	.20
19	.....	2.50	3.22	3.46	3.48	3.54	1.70	.55	.25	.20
20	.....	2.50	3.22	3.42	3.46	3.55	1.62	.55	.40	.20
21	.....	2.50	3.25	3.42	3.48	3.54	1.60	.52	.30	.20
22	.....	2.25	3.34	3.45	3.48	3.56	1.55	.62	.....	.20
23	.....	2.60	3.30	3.48	3.46	3.59	1.45	.50	.50	.20
24	1.78	2.68	3.31	3.42	3.48	3.55	1.40	.62	.40	.20
25	1.98	2.70	3.32	3.40	3.53	3.54	1.32	.60	.40	.20
26	1.98	2.70	3.29	3.40	3.52	3.55	1.31	.....	.40	.20
27	2.00	2.70	3.30	3.42	3.51	3.58	1.29	.75	.40	.....
28	1.98	2.70	3.34	3.50	3.49	3.58	1.25	.65	.40	.....
29	.....	2.70	3.35	3.46	3.50	.....	1.22	.65	.30	.....
30	.....	2.74	3.40	3.45	3.52	.....	1.20	.65	.30	.....
31	.....	2.75	.....	3.46	.....	3.28	1.20	.....	.40	.....

NOTE.—No water in canal Jan. 1 to Feb. 22, Mar. 8, July 30, Oct. 22, and Nov. 27 to Dec. 31. Water in canal during part of day only Feb. 23, Mar. 7 and 9, Apr. 6, and July 29. No reading Sept. 26, Oct. 3, 9, and 10.

Daily discharge, in second-feet, of Modesto canal near Lagrange, Cal., for 1911.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	0	296	452	574	590	594	610	134	44	22
2	0	136	452	570	594	610	614	126	55	14
3	0	140	456	564	586	598	610	110	54	14
4	0	155	444	574	596	610	606	103	53	14
5	0	151	434	574	586	612	610	117	55	14
6	0	146	220	570	584	610	614	84	43	14
7	0	70	450	574	586	598	586	75	41	14
8	0	0	510	570	584	598	522	84	38	14
9	0	120	524	576	590	618	476	69	36	14
10	0	234	514	570	590	610	438	69	34	14
11	0	198	502	580	594	606	384	76	32	14
12	0	198	524	564	590	606	354	44	22	7
13	0	204	510	574	590	610	334	45	22	7
14	0	224	552	576	586	610	314	62	22	7
15	0	244	544	572	590	610	294	38	22	7
16	0	344	524	576	590	604	264	43	7	7
17	0	382	538	578	586	610	270	40	14	7
18	0	394	550	580	598	602	244	43	14	7
19	0	394	538	586	590	602	234	38	10	7
20	0	394	538	578	586	604	218	38	22	7
21	0	394	544	578	590	602	214	34	14	7
22	0	344	562	584	590	606	204	45	0	7
23	120	414	554	590	586	612	184	32	32	7
24	250	430	556	578	590	604	174	45	22	7
25	290	434	558	574	600	602	159	43	22	7
26	290	434	552	574	598	604	157	52	22	7
27	294	434	554	578	596	610	153	62	22	0
28	290	434	562	594	592	610	146	49	22	0
29	.....	434	564	586	594	300	140	49	14	0
30	.....	442	574	584	598	0	136	49	14	0
31	.....	444	.....	586	.....	550	136	.....	22	.....

NOTE.—Daily discharge determined from a well-defined rating carve. Discharge estimated Feb. 23, Mar. 7 and 9, Apr. 6, and July 29. Discharge interpolated Sept. 26, Oct. 3, 9, and 10.

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Monthly discharge of Modesto canal near Lagrange, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	0	0	0	0	A.
February	294	0	54.8	3,040	A.
March	444	0	292	18,000	A.
April	574	220	512	30,500	A.
May	594	564	577	35,500	A.
June	600	584	591	35,200	A.
July	618	0	575	35,400	A.
August	614	136	335	20,600	A.
September	134	32	63.3	3,770	A.
October	55	0	27.3	1,680	B.
November	22	0	8.9	530	C.
December	0	0	0	0	A.
The year	618	0	254	184,000	

TURLOCK CANAL NEAR LAGRANGE, CAL.

Location.—Below tunnel on left bank of Tuolumne River at Lagrange dam, about 2 miles northeast of Lagrange.

Records available.—July, 1899, to December 31, 1911.

Gage.—Vertical staff float in concrete well, 190 feet below intake and below the spillway.

Discharge measurements.—Made from footbridge at Morgan flume half a mile below gage.

Accuracy.—Results are good. It is believed that the gage height record is slightly affected by change in stage of river at intake.

Cooperation.—After June 30, 1911, gage height record was furnished by the Turlock irrigation district, through Burton Smith, chief engineer.

Discharge measurements of Turlock canal near Lagrange, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 13	J. E. Stewart	6.22	1,010
July 26	do	6.19	1,010
26	do	4.30	621
26	do	2.99	379

Daily gage height, in feet, of Turlock canal near Lagrange, Cal., for 1911.

[H. T. Sackett, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1		5.50	5.95	6.25	6.18	6.00	2.33	0.95
2		5.50	6.00	6.25	6.20	5.85	2.25	.95
3		5.55	6.00	6.25	6.20	5.75	2.15	1.70
4		5.50	6.05	6.30	6.20	5.70	2.05	1.45
5		5.55	6.02	6.25	6.20	5.65	2.19	1.32
6		4.45	6.05	6.23	6.20	5.60	1.82	1.30
7		4.50	6.08	6.18	6.20	5.45	1.68	1.25
8	0.50	4.50	6.10	6.20	6.20	5.12	1.75	1.22
9	.50	5.00	6.12	6.23	6.10	5.30	1.75	1.20
10	1.30	4.95	6.15	6.25	6.18	5.10	1.40	1.20

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Daily gage height, in feet, of Turlock canal near Lagrange, Cal., for 1911—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
11	1.30	4.95	6.18	6.25	6.20	4.90	1.70	1.20
12	2.20	5.00	6.18	6.25	6.22	4.80	1.41	1.45
13	2.70	5.00	6.20	6.22	6.20	4.45	1.27	1.50
14	2.65	5.00	6.20	6.20	6.22	4.40	1.40	1.35
15	3.40	5.00	6.18	6.30	6.20	4.00	1.10	.....
16	3.40	5.00	6.18	6.22	6.20	3.82	1.05	.....
17	3.85	5.00	6.20	6.22	6.20	3.85	1.00	.....
18	3.80	5.00	6.18	6.22	6.20	3.55	1.00	.....
19	3.80	5.20	6.28	6.22	6.18	3.45	.95	.....
20	3.80	5.30	6.25	6.20	6.18	3.30	.95	.....
21	3.80	5.40	6.25	6.22	6.20	3.20	.85	.....
22	3.80	5.50	6.25	6.20	6.18	3.00	1.00	.....
23	4.30	5.52	6.25	6.20	6.12	2.88	.92	.....
24	4.30	5.52	6.22	6.18	6.15	2.75	1.00	.....
25	4.30	5.52	6.18	6.18	6.15	2.65	1.10	.....
26	4.30	5.60	6.20	6.22	6.15	2.55	1.25	.....
27	4.30	5.70	6.20	6.22	6.10	2.53	1.05	.....
28	4.60	5.80	6.20	6.20	6.02	2.48	1.00	.....
29	4.90	5.85	6.20	6.18	6.00	2.45	1.00	.....
30	4.90	5.90	6.23	6.20	6.15	2.40	1.00	.....
31	5.20	.....	6.18	.....	5.98	2.35	.....	.....

NOTE.—No water in canal Jan. 1 to Mar. 7 and Oct. 15 to Dec. 31.

Daily discharge, in second-feet, of Turlock canal near Lagrange, Cal., for 1911.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0	861	956	1,020	1,000	966	272	86
2	0	861	966	1,020	1,010	934	259	86
3	0	872	966	1,020	1,010	914	244	178
4	0	861	976	1,030	1,010	903	228	144
5	0	872	970	1,020	1,010	892	250	128
6	0	650	976	1,010	1,010	882	195	126
7	0	660	983	1,000	1,010	850	175	120
8	40	660	987	1,010	1,010	784	185	116
9	40	760	991	1,010	1,010	820	185	114
10	126	750	998	1,020	1,000	780	138	114
11	126	750	1,000	1,020	1,010	740	178	114
12	251	760	1,000	1,020	1,010	720	139	144
13	332	760	1,010	1,010	1,010	650	122	151
14	324	760	1,010	1,010	1,010	641	138	132
15	453	760	1,000	1,030	1,010	565	102	0
16	453	760	1,000	1,010	1,010	531	96	0
17	536	760	1,010	1,010	1,010	536	91	0
18	527	760	1,000	1,010	1,010	480	91	0
19	527	800	1,020	1,010	1,000	462	86	0
20	527	820	1,020	1,010	1,000	435	86	0
21	527	840	1,020	1,010	1,010	417	74	0
22	527	861	1,020	1,010	1,000	383	91	0
23	622	865	1,020	1,010	991	363	82	0
24	622	865	1,010	1,000	998	340	91	0
25	622	865	1,000	1,000	998	324	102	0
26	622	882	1,010	1,010	998	307	120	0
27	622	903	1,010	1,010	987	304	96	0
28	680	924	1,010	1,010	970	296	91	0
29	740	934	1,010	1,000	966	291	91	0
30	740	945	1,010	1,010	998	283	91	0
31	800	.....	1,000	.....	962	275	.....	0

NOTE.—Daily discharge determined from a rating curve well defined above 200 second-feet.

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Monthly discharge of Turlock canal near Lagrange, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	0	0	0	0	A.
February	0	0	0	0	A.
March	800	0	367	22,600	A.
April	945	650	813	48,400	A.
May	1,020	956	999	61,400	A.
June	1,030	1,000	1,010	60,100	A.
July	1,010	962	1,000	61,500	A.
August	966	275	583	35,800	A.
September	272	74	140	8,330	B.
October	178	0	56.5	3,470	C.
November	0	0	0	0	A.
December	0	0	0	0	A.
The year	1,030	0	417	302,000	

LAGRANGE WATER & POWER CO.'S CANAL NEAR LAGRANGE, CAL.

Location.—At the flume opposite Lagrange dam, about 1¼ miles above power house and 2 miles northeast of Lagrange.

Records available.—1908 to 1911 (not complete).

Gage.—Depth of water in flume is measured at reference point.

Discharge measurements.—Made in flume near point at which gage heights are observed.

Accuracy.—Results are good for period covered by gage heights.

Cooperation.—Gage-height record furnished by Turlock irrigation district through Burton Smith, chief engineer.

The Lagrange Water & Power Co.'s canal takes water from the south side of Tuolumne River at Indian Bar, about 15 miles above the town of Lagrange. This canal was built in the early days to supply water for hydraulic mining in the vicinity of Lagrange, and it is now locally known as the "old mining ditch." Recently it has been thoroughly repaired and is now used as a supply canal for the new hydroelectric plant which was installed in the latter part of 1907. The power house is situated on the bank of the river about half a mile above the town of Lagrange and is below the dam and headworks of the Turlock and Modesto irrigation canals.

Discharge measurements of Lagrange Water & Power Co.'s canal near Lagrange, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 16[a]	J. E. Stewart	2.04	42
May 13[a]	....do	2.72	65

[a] Made in flume opposite the Lagrange dam.

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Daily gage height, in feet, of Lagrange Water & Power Co.'s canal near Lagrange, Cal., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.67	2.72	2.70	2.68	2.70	2.52	2.70	2.73
2	.....	2.68	2.70	2.70	2.65	2.70	2.65	2.70	2.73
3	.....	2.68	2.72	2.70	2.55	2.72	.00	.25	2.70
4	.....	2.70	2.73	2.70	2.48	2.70	2.73	2.50	2.70
5	.....	2.73	2.72	2.70	2.55	2.70	2.70	2.62	2.72
6	.....	2.73	2.72	2.70	2.60	2.70	2.60	2.60	2.74
7	.....	2.73	2.72	2.70	2.65	2.70	2.50	2.60	2.75
8	.....	2.72	2.70	2.70	2.60	2.60	2.35	2.60	2.75
9	.....	2.72	2.70	.00	2.67	.00	2.30	2.60	2.74
10	.....	2.72	2.65	2.69	2.70	2.70	2.30	2.60	2.72
11	.....	2.74	2.72	2.70	2.70	2.70	2.70	2.72	.00
12	.....	2.72	2.72	2.69	2.70	2.75	2.74	2.72	2.55
13	.....	2.73	2.72	2.70	2.70	2.75	.00	2.72	.00
14	.....	2.73	2.72	2.70	2.70	.00	2.62	2.72	.00
15	.....	2.73	2.72	2.70	2.70	2.72	2.50	2.72	2.60
16	.....	2.72	2.70	2.70	2.70	2.65	2.30	2.72	2.60
17	.....	2.72	2.70	2.70	2.70	2.62	2.74	2.72	.00
18	.....	2.72	2.70	2.70	2.70	2.55	2.73	2.72	.00
19	.....	2.72	2.70	2.69	2.70	2.52	2.73	2.72	2.65
20	.....	2.72	2.70	2.70	2.70	2.30	2.73	2.72	2.60
21	.....	2.72	2.70	2.70	2.65	2.70	2.73	2.72	2.65
22	2.63	2.73	2.70	2.70	2.70	2.73	2.72	2.73	2.50
23	2.64	2.73	2.70	.00	2.70	2.70	2.70	2.73	.00
24	2.64	2.73	2.70	2.70	2.70	2.70	2.68	2.73	2.60
25	2.65	2.72	2.72	2.70	2.72	2.73	2.68	2.75	2.50
26	2.67	2.70	2.72	2.69	2.70	2.73	2.70	2.75	2.00
27	2.65	2.65	2.72	2.58	2.72	2.72	2.70	2.74	2.25
28	2.65	2.67	2.72	2.50	2.73	2.70	2.70	2.74	2.70
29	2.70	2.70	2.70	2.65	2.70	2.60	2.68	2.74	2.55
30	2.70	2.72	2.70	2.65	2.70	2.55	2.68	2.74	2.65
31	.....	2.72	.....	2.65	2.72	.....	2.70	.....	2.65

Daily discharge, in second-feet, of Lagrange Water & Power Co.'s canal near Lagrange, Cal., for 1911.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	63	65	64	64	64	58	64	66
2	.....	64	64	64	63	64	63	64	66
3	.....	64	65	64	59	65	0	2.5	64
4	.....	64	66	64	57	64	66	58	64
5	.....	66	65	64	59	64	64	62	65
6	.....	66	65	64	61	64	61	61	66
7	.....	66	65	64	63	64	58	61	66
8	.....	65	64	64	61	61	52	61	66
9	.....	65	64	0	63	0	50	61	66
10	.....	65	63	64	64	64	50	61	65
11	.....	66	65	64	64	64	64	65	0
12	.....	65	65	64	64	66	66	65	59
13	.....	66	65	64	64	66	0	65	0
14	.....	66	65	64	64	0	62	65	0
15	.....	66	65	64	64	65	58	65	61
16	.....	65	64	64	64	63	50	65	61
17	.....	65	64	64	64	62	66	65	0
18	.....	65	64	64	64	59	66	65	0
19	.....	65	64	64	64	58	66	65	63
20	.....	65	64	64	64	50	66	65	61
21	.....	65	64	64	63	64	66	65	63
22	62	66	64	64	64	66	65	66	58
23	62	66	64	0	64	64	64	66	0
24	62	66	64	64	64	64	64	66	61
25	63	65	65	64	65	66	64	66	58
26	63	64	65	64	64	66	64	66	41
27	63	63	65	60	65	65	64	66	49
28	63	63	65	58	66	64	64	66	64
29	64	64	64	63	64	61	64	66	59
30	64	65	64	63	64	59	64	66	63
31	.....	65	.....	63	65	.....	64	.....	63

NOTE.—Daily discharge determined from a rating curve well defined above 10 second-feet.

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Monthly discharge of Lagrange Water & Power Co.'s canal near Lagrange Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	.....	.....	60	3,690	B.
February	.....	.....	60	3,330	B.
March	.....	.....	60	3,690	B.
April	.....	.....	60.9	3,620	B.
May	66	63	65.0	4,000	A.
June	66	63	62.5	3,720	A.
July	64	0	59.5	3,660	A.
August	66	57	63.3	3,890	A.
September	66	0	58.9	3,500	A.
October	66	0	57.8	3,550	A.
November	66	2.5	62.2	3,700	A.
December	66	0	49.6	3,050	A.
The year	66	0	60.1	43,400	

NOTE.—Inquiry of Mr. Burton Smith indicates that 60 second-feet is a fair estimate of the average daily discharge from Jan. 1 to Apr. 21.

JAWBONE CREEK NEAR TUOLUMNE, CAL.

Location.—At Jawbone ranger station, in the NE. ¼ sec. 33, T. 1 N., R. 18 E., in the Stanislaus National Forest, 1½ miles above junction with Tuolumne River and about 12 miles southeast of Tuolumne.

Records available.—September 13, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections fastened to an alder tree on right bank 100 feet below trail crossing.

Channel.—Gravel and bowlders and will shift at high stages.

Discharge measurements.—Made from old bridge about 1,000 feet below gage and by wading.

Winter flow.—Somewhat affected by ice.

Diversions.—Small irrigation ditch at ranger's station above the gage.

Accuracy.—Results are fair but estimates are withheld for more measurements.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of Jawbone Creek near Tuolumne, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 29	Egbert and Clark	2.78	247
June 17	H. J. Tompkins	.65	46
Aug. 29[a]	.....do	−.25	6.9

[a] Made by wading 100 feet below gage. Ranger ditch carried about one-half second-foot.

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Daily gage height, in feet, of Jawbone Creek near Tuolumne, Cal., for 1911.

[J. B. Pestoni, H. L. Mero, and B. F. Tyler, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.60	0.25	1.48	1.45	1.10	0.26	.....	.....	−0.23	0.11	.....
2	.....	1.20	.22	1.50	1.45	1.08	.25	.....	−0.35	− .18	.11	0.30
3	.....	1.00	.68	1.55	1.45	1.08	.23	.....	− .35	.....	.10	.30
4	0.30	1.00	.90	1.45	1.46	1.00	.20	.....	− .35	.....	.10	.35
5	.30	.80	.92	2.20	1.52	1.00	.19	.....	− .35	.....	.11	.35
6	.30	.70	.90	2.10	1.45	1.00	.16	.....	− .34	− .18	.10	.44
7	.29	.60	1.35	1.80	1.45	1.00	.15	.....	− .34	.....	.10	.....
8	.29	.52	1.75	1.70	1.35	.97	.12	.....	− .35	.....	.....	.35
9	.31	.48	1.75	1.80	1.40	.93	.12	.....	− .35	.....	.....	.33
10	.70	.42	1.75	1.70	1.35	.89	.80	.....	− .36	.....	.....	.34
11	.52	.45	1.38	1.60	1.38	.87	.50	.....	− .37	− .06	.32	.30
12	.50	.45	1.20	1.50	1.35	.84	.....	.....	− .37	− .01	.31	.31
13	.75	.42	1.10	1.40	1.35	.82	.60	.....	− .37	.00	.31	.....
14	.80	.45	1.02	1.40	1.32	.78	.....	.....	− .38	+ .02	.30	.32
15	.81	.40	1.00	1.38	1.28	.70	.20	.....	− .38	.....	.....	.....
16	.65	.40	1.00	1.40	1.25	.70	.....	.....	− .38	.01	.35	.....
17	.60	.40	1.03	1.42	1.20	.68	.....	.....	− .38	.00	.33	.....
18	.55	.38	1.02	1.43	1.20	.63	.....	.....	− .38	.06	.33	.....
19	.50	.....	1.07	1.44	1.20	.60	.....	.....	− .38	.07	.....	.....
20	1.20	.30	1.09	1.50	1.22	.55	.....	.....	− .39	.09	.....	.48
21	1.20	.26	1.10	1.45	1.25	.52	.....	.....	− .39	.10	.30	.48
22	.92	.25	1.05	1.45	1.30	.50	.....	.....	− .39	.07	.31	.....
23	.80	.28	1.10	1.50	1.30	.47	.....	.....	− .36	.....	.....	.....
24	2.10	.25	1.10	1.55	1.25	.44	.....	−0.24	− .38	.08	.....	.38
25	2.00	.20	.....	1.60	1.25	.41	.....	− .25	− .35	.08	.....	.37
26	1.32	.80	1.30	1.60	1.20	.40	.....	− .25	− .36	.08	.....	.42
27	1.10	.20	1.20	1.55	1.15	.38	.....	− .25	− .37	.....	.....	.34
28	1.00	.15	1.20	1.45	1.15	.35	.....	− .25	− .33	.14	.....	.39
29	3.15	.....	1.25	1.45	1.12	.32	.....	− .27	− .27	.13	.....	.42
30	3.72	.....	1.35	1.45	1.10	.30	.....	− .30	− .25	.....	.....	.42
31	3.00	.....	1.40	.....	1.10	.....	.....	− .35	.....	.....	.....	.....

NOTE.—Ice for short periods January, February, and the latter part of December. Water surface below zero of the gage July 16 to Aug. 23. Creek rose to 5 feet during night of Jan. 31.

CORRAL CREEK NEAR GROVELAND, CAL.

Location.—At Clavey trail crossing, 1 mile west of Jawbone ranger station, in Stanislaus National Forest, 2 miles above junction with Tuolumne River, and 15 miles northwest of Groveland.

Records available.—October 21, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on right bank at trail crossing.

Channel.—Bowlders and gravel; rough.

Discharge measurements.—Made by wading.

Winter flow.—Probably affected by ice.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are secured.

Discharge measurements of Corral Creek near Groveland, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 18[a]	H. J. Tompkins	0.85	2.8
Aug. 29[a]	....do	.70	1.1

[a] Made by wading.

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Daily gage height, in feet, of Corral Creek near Groveland, Cal., for 1911.

[J. B. Pestoni, H. L. Mero, and B. F. Tyler, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		2.70				0.95						
2				1.20								
3						.92		0.77				
4		1.50	1.60	1.15								0.80
5	0.70											.80
6										0.78	0.76	.85
7						.90	0.82					.80
8		1.20	2.10			.90			0.72			.79
9		1.15		1.50	1.00		.80					.79
10						.87	.72					
11							.79					
12							.82			.78		.78
13							.82					
14	1.10											
15	1.00	1.10						.71		.75	.80	
16	.82			1.10				.72				.78
17					.80				.72		.80	
18	.72	1.10				.85	.79		.72			
19							.80					
20	2.00	1.50					.78				.79	
21	1.20	1.10					.80					.80
22	.98										.77	.79
23			1.40				.78					
24	2.50		1.40					.74				
25				1.10	.95		.74					
26			1.30									
27												
28	1.10		1.20			.82	.74	.70		.77		
29				1.05			.78	.70				
30				1.08			.76					
31												

SOUTH FORK OF TUOLUMNE RIVER NEAR GROVELAND, CAL.

Location.—At South Fork trail bridge, in Stanislaus National Forest, one-fourth mile above junction with Tuolumne River and about 10 miles east of Groveland. The Middle Fork enters about 2½ miles above the station.

Records available.—September 13, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on middle pier of bridge.

Channel.—Bowlders and gravel.

Discharge measurements.—Made by wading.

Diversions.—At the Hardin ranch, 7 miles above the mouth, water is diverted to develop power and is not returned to the river.

Cooperation.—Gage height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

The following discharge measurement was made by H. J. Tompkins by wading below the gage:

August 28, 1911: Gage height, 0.70 feet; discharge, 26 second-feet.

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Daily gage height, in feet, of South Fork of Tuolumne River near Groveland, Cal., for 1911.

[J. B. Pestoni and B. F. Tyler, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1			2.2	3.6				1.18				
2												
3	0.8				3.5					0.82		
4											0.81	
5				4.85		4.0						0.89
6			3.5						0.80			
7												
8		1.75	4.5								.80	
9							1.12					
10						4.0						
11												.80
12				3.5							.92	.80
13						3.8			.70			.79
14		2.75		3.5							1.02	
15			2.3	3.5		3.7						
16		2.5			3.2							
17						3.8						
18							1.88				.90	
19				3.5								.80
20			3.0									
21								.82	.70			
22		2.3	3.2			3.4						
23					3.9	3.4				.80		
24						3.25				.80		
25	4.0						1.48					
26				3.8					.79			.79
27	2.3											
28								.70				
29					3.2					.84		
30			2.75									
31								.70		.80		

CLAVEY RIVER NEAR TUOLUMNE, CAL.

Location.—Below Luke Meadow trail bridge, in the NW. ¼ SW. ¼ sec. 24, T. 1 N., R. 17 E., M. D. M., in the Stanislaus National Forest, about 11 miles above junction with Tuolumne River, and 10 miles southeast of Tuolumne.

Records available.—September 12, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections on left bank 150 feet below trail bridge.

Channel.—Bowlders and solid rock; is rough; current swift at all stages.

Discharge measurements.—Made by wading.

Cooperation.—Gage height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements can be made.

The following discharge measurement was made by H. J. Tompkins by wading:

August 30, 1911: Gage height, 1.05 feet; discharge, 31 second-feet.

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Daily gage height, in feet, of Clavey River near Tuolumne, Cal., for 1911.

[J. B. Pestoni and B. F. Tyler, observers.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.0				5.8						
2				6.0							
3					5.55						
4	5.0								0.95		
5											2.00
6										0.85	
7										.86	
8	3.8										
9	3.8			5.8		3.6					
10					6.0						
11						3.45					
12											
13											
14							1.4				
15							1.2		.9	.99	
16											.94
17					5.5			1.0		1.07	
18	3.0			4.9			1.5	.95			.69
19							1.5				
20	3.0									1.35	
21	2.98				5.1						.80
22									1.1	1.00	.96
23						2.5					
24		5.0									
25											
26		5.2							.85		
27											
28		6.0							.9		
29			5.8			2.0					
30			5.85			2.05	1.05				
31											

INDIAN CREEK [1] NEAR TUOLUMNE, CAL.

Location.—At Clavey River trail bridge, in the Stanislaus National Forest, 300 feet above mouth, and about 10 miles southeast of Tuolumne, Indian Creek joins Clavey River about half a mile below mouth of Reed Creek and 1 mile above mouth of Quilty Creek.

Records available.—October 22, 1910, to June 10, 1911.

Drainage area.—Not measured.

Channel.—Bowlders and gravel; rough.

Discharge measurements.—Made by wading. No measurements were made during 1911.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

[1] Also known as Bear Creek.

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Daily gage height, in feet, of Indian Creek near Tuolumne, Cal., for 1911.

[J. B. Pestoni, observer.]

Day.	Feb.	Mar.	Apr.	May.	June.	Day.	Feb.	Mar.	Apr.	May.	June.
1	3.0			1.4		16					
2						17					
3						18	1.5				
4	2.5					19					
5						20	1.5				
6						21	1.5				
7						22					
8	1.0					23					
9	2.7			1.3		24		2.4			
10					1.0	25					
11						26		2.5			
12						27					
13				1.3		28		2.3			
14						29			1.5		
15						30			1.45		
						31					

NORTH FORK OF TUOLUMNE RIVER NEAR TUOLUMNE, CAL.

Location.—At Providence Mine highway bridge, in the Stanislaus National Forest, in the SE. ¼ sec. 9, T. 1 N., R. 16 E., about 2 miles southeast of Tuolumne. Basin Slope Creek enters about 3 miles above and Hunter Creek 2 miles below the station.

Records available.—September 11, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to left abutment of bridge. August 31, 1911, a new vertical staff for low water was installed 100 feet below bridge at a different datum.

Channel.—Solid rock, small bowlders, and sand. Section is rough and will shift at high water.

Discharge measurements.—Made from bridge or by wading.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

Discharge measurements of North Fork of Tuolumne River near Tuolumne, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 19[a]	H. J. Tompkins	1.48	115
Aug. 31[b]	.....do	[c] 1.92	18

[a] Made by wading.
[b] Made by wading 100 feet above bridge.
[c] Referenced to new gage established Aug. 31 at new location and datum. See station description. Old gage read 0.50 foot.

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Daily gage height, in feet, of North Fork of Tuolumne River near Tuolumne, Cal., for 1911.

[J. B. Pestoni and H. L. Mero, observers.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.5			2.75	2.0			1.9			
2											
3					2.0	1.0					2.02
4	2.5										
5											
6											
7											
8											
9											
10					1.9	.6					
11								1.9			
12					1.9						
13			2.75								
14											
15											
16											
17				2.2	1.65						
18				2.75							
19					1.48						
20											
21											
22											
23		2.8									
24											
25											
26		2.8									
27		3.0									
28											
29								1.95			
30			2.7								
31							1.92				

NOTE.—Gage heights August to December referred to new datum.

HUNTER CREEK NEAR TUOLUMNE, CAL.

Location.—At Luke Meadow ford, in the NW. ¼ NE. ¼ sec. 19, T. 1 N., R. 17 E., in the Stanislaus National Forest, about 5 miles above junction with North Fork of Tuolumne River and 6 miles southeast of Tuolumne.

Records available.—September 11, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on left bank, 50 feet above ford.

Channel.—Coarse gravel; slightly shifting.

Discharge measurements.—Made by wading.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

Discharge measurements of Hunter Creek near Tuolumne, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
June 19[a]	H. J. Tompkins	0.63	3.4
Aug. 30[b]	do	.35	1.0

[a] Made by wading below the gage and below the ford.
[b] Made from banks about 100 feet below gage.

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Daily gage height, in feet, of Hunter Creek near Tuolumne, Cal., for 1911.

[J. B. Pestoni and B. F. Tyler, observers.]

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.00			0.80	0.70		0.46	0.38			
2							.43	.36			
3					.70	0.52	.45	.38			
4	1.20						.46	.41	0.48		
5							.45	.41			
6							.45	.41			
7							.46	.41			
8							.46	.41			
9	.91					.50	.45	.41			
10					.67	.50	.45	.41			
11								.39			
12							.46	.41			
13			.90				.40	.41			
14							.42	.38			
15							.40	.39			
16							.43	.40			
17				.70	.65		.44	.38			
18	.88			.75			.43	.40			
19					.63		.42	.39			
20	.90							.38			
21	.84						.42	.39			
22							.42	.40	.44	0.44	0.54
23		1.12						.41		.54	
24						.50	.40	.40			
25		1.10				.50	.37	.41			
26		1.10				.50	.38		.47		
27		1.20				.50	.38		.49		
28						.50	.40	.40			
29						.47	.40				
30			.83			.49	.38	.42			
31							.40				

STANISLAUS RIVER AT KNIGHTS FERRY, CAL.

Location.—At Knights Ferry, in the NE. ¼ sec. 29, T. 1 S., R. 12 E., about 25 miles below mouth of South Fork, and 12 miles northeast of Oakdale.

Records available.—May 19, 1903, to December 31, 1911. From May 3, 1895, to February 16, 1901 a station was maintained one-half mile north of Oakdale.

Drainage area.—935 square miles.

Gage.—Staff in five sections on right bank; four vertical and one inclined. The original gage datum has been maintained although several changes have been made in the gage. Zero of gage is 157.53 feet above sea level, United States Geological Survey datum.

Channel.—Small bowlders and gravel; slightly shifting at high stages.

Discharge measurements.—Car and cable 25 feet above gage.

Storage and diversions.—Ditches diverting water for use in mining are numerous above the station. Water is also diverted from the South Fork into the Tuolumne basin and from the North Fork for use in the vicinity of Murphy and Angeles. The intake of the Stanislaus Water Co.'s canal is about 3 miles above Knights Ferry. This canal returns water below the station. Schell ditch diverts about 6 second-feet from this canal above the gaging station on the canal. Considerable storage is developed on Middle Fork of Stanislaus River for power purposes.

Accuracy.—Results are affected by the many diversions for irrigation and mining and by the operation of a power plant a short distance above the gage. Record is considered good except at extreme low water and flood stage.

The discharge of the river at this point is determined by combining the discharge at the river gaging station with the discharge of Stanislaus Water Co.'s canal and Schell's ditch.

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Discharge measurements of Stanislaus River at Knights Ferry, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 16	J. E. Stewart	8.26	2,030
Mar. 10	do	11.70	8,510
May 12	do	11.08	7,270
June 14	W. V. Hardy	12.50	10,600
July 25	J. E. Stewart	7.34	1,630
Sept. 19	do	5.22	163

Daily gage height, in feet, of Stanislaus River at Knights Ferry, Cal., for 1911.

[E. J. Coop, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.85	13.25	8.40	11.10	10.39	10.35	9.42	.....	5.54	5.45	5.45	5.62
2	5.75	11.25	8.42	11.18	10.26	10.90	9.42	.....	5.40	5.40	5.38	5.50
3	5.70	10.32	9.18	11.39	10.24	11.40	9.58	6.45	5.62	5.45	5.35	5.56
4	5.78	10.20	10.92	10.71	11.02	11.82	9.70	6.28	5.60	5.35	5.45	5.56
5	5.80	9.72	10.80	11.25	11.68	12.05	9.58	6.30	5.58	5.42	5.40	5.50
6	5.76	9.38	10.84	11.95	10.60	12.15	9.68	6.14	5.45	5.36	5.28	5.68
7	5.90	9.05	14.02	11.00	10.28	11.95	9.58	6.00	5.38	5.45	5.35	5.40
8	5.66	8.76	13.65	10.62	10.18	11.78	9.36	6.02	5.40	5.30	5.32	5.50
9	5.84	8.62	12.08	11.15	10.45	11.68	9.05	6.02	5.32	5.28	5.36	5.46
10	6.95	8.48	11.52	10.75	10.32	11.95	8.94	6.09	5.33	5.30	5.55	5.44
11	6.55	8.82	10.52	10.22	10.55	11.35	9.04	5.92	5.34	5.31	5.72	5.52
12	7.61	8.40	9.90	9.92	10.92	12.75	9.20	5.96	5.31	5.34	5.65	5.38
13	10.33	9.42	9.65	9.62	10.68	12.55	8.95	5.90	5.30	5.28	5.70	5.48
14	8.70	9.20	9.40	9.42	10.58	12.30	9.00	5.80	5.16	5.30	5.63	5.48
15	8.46	8.98	9.22	9.30	10.10	12.22	8.65	5.85	5.30	5.34	5.62	5.45
16	7.18	8.34	9.15	9.32	9.79	12.35	8.88	5.82	5.30	5.31	5.65	5.45
17	6.72	8.08	9.12	9.49	9.66	12.30	8.62	5.85	5.20	5.26	5.65	5.58
18	6.65	8.05	9.15	9.80	9.42	12.24	8.75	.....	5.28	5.35	5.70	5.51
19	6.78	8.00	9.25	10.16	10.15	12.15	8.52	5.55	5.21	5.38	5.70	5.51
20	9.48	7.94	9.34	10.11	10.52	12.05	8.25	5.62	5.34	5.30	5.68	5.51
21	9.23	7.88	9.38	10.12	11.05	11.75	7.95	5.54	5.28	5.30	5.60	5.42
22	7.85	7.75	9.45	10.40	11.60	11.22	7.68	5.44	5.30	5.34	5.62	5.44
23	7.34	7.72	9.52	10.76	12.18	10.82	7.15	5.56	5.30	5.30	5.62	5.45
24	11.33	7.72	9.60	11.08	12.20	10.02	7.25	5.51	5.26	5.34	5.68	5.38
25	11.48	7.55	9.65	11.42	11.25	9.70	7.40	5.46	5.28	5.24	5.70	5.38
26	9.42	7.55	9.75	11.52	10.69	9.80	7.15	5.44	5.30	5.29	5.65	5.26
27	8.65	7.60	9.78	11.05	10.72	10.38	7.15	5.56	5.39	5.29	5.65	5.42
28	8.15	7.52	9.98	10.35	10.95	10.58	7.00	5.45	5.30	5.32	5.62	5.56
29	10.57	.....	10.12	9.95	11.05	10.08	.....	5.44	5.29	5.34	5.55	5.81
30	19.83	.....	10.38	10.00	10.95	9.80	.....	5.40	5.37	5.35	5.69	5.58
31	[a]20.14	.....	10.68	.....	10.38	.....	.....	5.40	.....	5.29	.....	5.61

[a] Crest height, 26 feet 4 a. m., Jan. 31.

NOTE.—Gage heights Jan. 12–16, 19–25, 29–31, and Mar. 3–10 determined by means of graph.

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Daily discharge, in second-feet, of Stanislaus River at Knights Ferry, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	202	12,300	2,190	7,300	5,860	5,790	4,260	982	293	252	252	330
2	170	6,980	2,210	7,480	5,630	6,870	4,260	912	230	230	222	275
3	155	5,060	3,190	7,950	5,590	7,970	4,500	842	330	252	210	302
4	179	4,840	6,260	6,480	7,120	8,950	4,690	716	320	210	252	302
5	185	4,010	6,010	7,630	8,610	9,500	4,500	730	311	239	230	275
6	173	3,480	6,090	9,260	6,260	9,740	4,660	621	252	214	183	360
7	220	3,010	14,700	7,080	5,660	9,260	4,500	530	222	252	210	230
8	145	2,630	13,700	6,300	5,490	8,850	4,170	543	230	190	198	275
9	199	2,460	9,570	7,410	5,980	8,610	3,720	543	198	183	214	257
10	775	2,290	8,250	6,560	5,740	9,260	3,570	588	202	190	298	248
11	515	2,710	6,110	5,560	6,160	7,860	3,710	486	206	194	380	284
12	1,340	2,190	5,010	5,040	6,910	11,300	3,930	508	194	206	345	222
13	5,080	3,540	4,610	4,560	6,420	10,800	3,580	475	190	183	370	266
14	2,560	3,220	4,230	4,260	6,220	10,100	3,650	420	143	190	335	266
15	2,260	2,910	3,960	4,080	5,350	9,920	3,160	448	190	206	330	252
16	949	2,120	3,860	4,110	4,830	10,200	3,480	431	190	194	345	252
17	618	1,830	3,820	4,360	4,630	10,100	3,120	448	155	176	345	311
18	575	1,800	3,860	4,850	4,260	9,970	3,300	373	183	210	370	280
19	657	1,740	4,000	5,450	5,440	9,740	2,990	298	158	222	370	280
20	3,630	1,670	4,140	5,370	6,110	9,500	2,650	330	206	190	360	280
21	3,260	1,610	4,200	5,380	7,190	8,780	2,300	293	183	190	320	239
22	1,580	1,480	4,300	5,880	8,430	7,560	1,990	248	190	206	330	248
23	1,090	1,440	4,410	6,580	9,820	6,700	1,450	302	190	190	330	252
24	7,170	1,440	4,530	7,260	9,870	5,210	1,540	280	176	206	360	222
25	7,510	1,280	4,610	8,020	7,630	4,690	1,700	257	183	169	370	222
26	3,540	1,280	4,770	8,250	6,440	4,850	1,450	248	190	186	345	176
27	2,490	1,320	4,820	7,190	6,500	5,840	1,450	302	226	186	345	239
28	1,900	1,250	5,150	5,790	6,980	6,220	1,300	252	190	198	330	302
29	5,540	.....	5,380	5,100	7,190	5,320	1,220	248	186	206	298	426
30	35,600	.....	5,840	5,180	6,980	4,850	1,140	230	218	210	365	311
31	36,900	.....	6,420	.....	5,840	.....	1,060	230	.....	186	.....	325

NOTE.—Daily discharge determined from two fairly well-defined rating curves applicable Jan. 1 to Mar. 7 and Mar. 8 to Dec. 31. Discharge interpolated July 29 to Aug. 2 and Aug. 18.

Combined daily discharge, in second-feet, of Stanislaus River, Stanislaus Water Co.'s canal, and Schell ditch at Knights Ferry, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	249	12,300	2,200	7,310	5,960	5,900	4,380	1,090	396	347	268	336
2	213	6,990	2,220	7,490	5,730	6,980	4,380	1,020	333	325	238	281
3	204	5,070	3,200	7,960	5,690	8,080	4,620	953	336	344	226	308
4	222	4,850	6,270	6,530	7,220	9,060	4,800	827	326	305	268	308
5	234	4,020	6,020	7,680	8,710	9,610	4,620	841	347	334	246	281
6	216	3,490	6,100	9,320	6,360	9,850	4,780	732	355	309	199	366
7	259	3,020	14,700	7,140	5,760	9,370	4,570	637	325	344	226	236
8	194	2,640	13,700	6,370	5,600	8,960	4,290	654	337	282	214	281
9	242	2,470	9,580	7,490	6,090	8,720	3,840	654	301	275	230	263
10	803	2,300	8,260	6,660	5,850	9,370	3,690	699	305	278	314	254
11	538	2,720	6,120	5,660	6,270	7,970	3,820	597	309	282	391	290
12	1,380	2,200	5,020	5,140	7,020	11,400	4,040	619	297	298	351	228
13	5,130	3,550	4,620	4,660	6,530	10,900	3,690	582	293	271	376	272
14	2,600	3,230	4,240	4,360	6,330	10,200	3,760	523	246	278	341	272
15	2,340	2,920	3,970	4,180	5,460	10,000	3,280	555	293	294	336	258
16	1,010	2,130	3,870	4,210	4,940	10,300	3,590	534	293	282	351	258
17	674	1,840	3,830	4,460	4,740	10,200	3,230	551	250	245	351	317
18	628	1,810	3,870	4,950	4,370	10,100	3,410	476	278	273	376	286
19	708	1,750	4,010	5,550	5,550	9,850	3,100	401	257	271	376	286
20	3,680	1,680	4,150	5,470	6,220	9,610	2,760	433	301	239	366	286
21	3,310	1,620	4,210	5,480	7,300	8,890	2,420	396	278	239	326	245
22	1,610	1,490	4,310	5,980	8,540	7,670	2,100	355	285	255	336	254
23	1,100	1,450	4,420	6,680	9,930	6,810	1,560	409	289	239	336	258
24	7,180	1,450	4,540	7,360	9,980	5,320	1,650	383	275	255	366	228
25	7,520	1,290	4,620	8,120	7,740	4,800	1,810	360	278	218	376	228
26	3,550	1,290	4,780	8,350	6,550	4,960	1,560	351	289	235	351	182
27	2,500	1,330	4,830	7,290	6,610	5,950	1,560	409	321	235	351	245
28	1,910	1,260	5,160	5,890	7,090	6,330	1,410	355	285	247	336	308
29	5,550	.....	5,390	5,200	7,300	5,430	1,330	351	281	257	304	432
30	35,600	.....	5,850	5,280	7,090	4,960	1,250	333	313	259	371	317
31	36,900	.....	6,430	.....	5,950	.....	1,170	333	.....	235	.....	331

NOTE.—Schell ditch assumed to be carrying 6 second-feet throughout the year.

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Monthly discharge of Stanislaus River at Knights Ferry, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	36,900	145	4,100	252,000	B.
February	12,300	1,250	2,920	162,000	A.
March	14,700	2,190	5,490	338,000	A.
April	9,260	4,080	6,190	368,000	A.
May	9,870	4,260	6,490	399,000	A.
June	11,300	4,690	8,140	484,000	A.
July	4,690	1,060	3,000	184,000	A.
August	982	230	455	28,000	A.
September	330	143	211	12,600	A.
October	252	169	204	12,500	A.
November	380	183	307	18,300	A.
December	426	176	274	16,800	A.
The year	36,900	143	3,140	2,280,000	

Combined monthly discharge of Stanislaus River, Stanislaus Water Co.'s canal, and Schell ditch at Knights Ferry, Cal., for 1911.

[Drainage area, 935 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	36,900	194	4,140	4.43	5.11	255,000	B.
February	12,300	1,260	2,930	3.13	3.26	163,000	A.
March	14,700	2,200	5,500	5.88	6.78	338,000	A.
April	9,320	4,180	6,270	6.71	7.49	373,000	A.
May	9,980	4,370	6,600	7.06	8.14	406,000	A.
June	11,400	4,800	8,250	8.82	9.84	491,000	A.
July	4,800	1,170	3,110	3.33	3.84	191,000	A.
August	1,090	333	565	.604	.70	34,700	A.
September	396	246	302	.323	.36	18,000	A.
October	347	218	276	.295	.34	17,000	A.
November	391	199	317	.339	.38	18,900	A.
December	432	182	280	.299	.34	17,200	A.
The year	36,900	182	3,210	3.43	46.58	2,320,000	

STANISLAUS WATER CO.'S CANAL AT KNIGHTS FERRY, CAL.

Location.—At private highway bridge about 200 feet below crossing of flume of Schell ditch, in the NW. ¼ sec. 29, T. 1 S., R. 12 E., about half a mile below Knights Ferry.

Records available.—June 11, 1904, to December 31, 1911.

Gage.—Vertical staff on left bank at bridge.

Discharge measurements.—Made from footplank 20 feet above gage. Section is coarse gravel and a little rough.

Accuracy.—Record does not include the flow of Schell ditch. Results are good.

Discharge measurements of Stanislaus Water Co.'s canal at Knights Ferry, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 12	J. E. Stewart	3.70	114
June 14	W. V. Hardy	3.62	87
July 25	J. E. Stewart	3.52	108
Sept. 19	.....do	3.38	95

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Daily gage height, in feet, of Stanislaus Water Co.'s canal at Knights Ferry, Cal., for 1911.

[Otto Dolling, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	2.45	.....	.....	.....	3.4	3.5	3.6	3.45	3.4	3.3	1.45
2	2.35	.....	.....	1.3	3.4	3.5	3.6	3.5	3.4	3.3	1.85
3	2.5	.....	.....	1.3	3.4	3.5	3.6	3.5	.....	3.25	1.45
4	2.35	.....	.....	2.45	3.4	3.5	3.55	3.5	.....	3.3	1.45
5	2.5	.....	.....	2.45	3.4	3.5	3.55	3.5	.....	3.3	1.45
6	2.35	.....	.....	2.7	3.4	3.5	3.6	3.5	3.4	3.3	1.45
7	2.25	.....	.....	2.7	3.4	3.5	2.92	3.45	3.4	3.25	1.45
8	2.5	.....	.....	2.9	3.45	3.5	3.6	3.5	3.45	3.25	1.45
9	2.35	.....	.....	3.1	3.5	3.5	3.6	3.5	3.4	3.25	1.45
10	1.95	.....	.....	3.35	3.5	3.5	3.6	3.5	3.4	3.2	1.45
11	1.8	.....	.....	3.35	3.5	3.5	3.5	3.5	3.4	3.2	.....
12	2.25	.....	.....	3.4	3.5	3.5	3.5	3.5	3.4	3.25	.....
13	2.5	.....	.....	3.35	3.5	3.5	3.5	3.45	3.4	3.2	.....
14	2.25	.....	.....	3.35	3.5	3.5	3.5	3.4	3.4	3.2	.....
15	3.1	.....	.....	3.4	3.5	3.5	3.55	3.45	3.4	3.2	.....
16	2.8	.....	.....	3.4	3.5	3.5	3.5	3.4	3.4	3.2	.....
17	2.65	.....	.....	3.4	3.5	3.5	3.5	3.4	3.3	2.9	.....
18	2.6	.....	.....	3.4	3.5	3.5	3.5	3.4	3.3	2.8	.....
19	2.55	.....	.....	3.4	3.5	3.5	3.55	3.4	3.35	2.5	.....
20	2.6	.....	.....	3.4	3.5	3.5	3.55	3.4	3.3	2.5	.....
21	2.5	.....	.....	3.4	3.5	3.5	3.6	3.4	3.3	2.5	.....
22	1.9	.....	.....	3.4	3.5	3.5	3.5	3.45	3.3	2.5	.....
23	.....	.....	.....	3.4	3.5	3.5	3.5	3.45	3.35	2.5	.....
24	.....	.....	.....	3.4	3.5	3.5	3.5	3.4	3.35	2.5	.....
25	.....	.....	.....	3.4	3.5	3.5	3.5	3.4	3.3	2.5	.....
26	.....	.....	.....	3.4	3.5	3.5	3.5	3.4	3.35	2.5	.....
27	.....	.....	.....	3.4	3.5	3.5	3.5	3.45	3.3	2.5	.....
28	.....	.....	.....	3.4	3.5	3.5	3.5	3.4	3.3	2.5	.....
29	.....	.....	.....	3.4	3.5	3.5	3.5	3.4	3.3	2.55	.....
30	.....	.....	.....	3.4	3.5	3.5	3.5	3.4	3.3	2.5	.....
31	.....	.....	.....	.....	3.5	.....	3.5	3.4	.....	2.5	.....

NOTE.—No water in canal Jan. 23 to Mar. 31, Sept. 3 and 4, and Nov. 12 to Dec. 31. Water in canal part of day Apr. 1, Sept. 5, and Nov. 11.

Daily discharge, in second-feet, of Stanislaus Water Co.'s canal at Knights Ferry, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	41	.....	.....	4	97	105	113	101	97	89	10
2	37	.....	.....	7	97	105	113	105	97	89	10
3	43	.....	.....	7	97	105	113	105	0	86	10
4	37	.....	.....	41	97	105	109	105	0	89	10
5	43	.....	.....	41	97	105	109	105	30	89	10
6	37	.....	.....	52	97	105	113	105	97	89	10
7	33	.....	.....	52	97	105	64	101	97	86	10
8	43	.....	.....	63	101	105	113	105	101	86	10
9	37	.....	.....	75	106	105	113	105	97	86	10
10	22	.....	.....	93	105	105	113	105	97	82	10
11	17	.....	.....	93	105	105	105	105	97	82	5
12	33	.....	.....	97	105	105	105	105	97	86	0
13	43	.....	.....	93	105	105	105	101	97	82	0
14	33	.....	.....	93	105	105	105	97	97	82	0
15	75	.....	.....	97	105	105	109	101	97	82	0
16	57	.....	.....	97	105	105	105	97	97	82	0
17	50	.....	.....	97	105	105	105	97	89	63	0
18	47	.....	.....	97	105	105	105	97	89	57	0
19	45	.....	.....	97	105	105	109	97	93	43	0
20	47	.....	.....	97	106	105	109	97	89	43	0
21	43	.....	.....	97	106	105	113	97	89	43	0
22	20	.....	.....	97	105	105	105	101	89	43	0
23	0	.....	.....	97	106	105	105	101	93	43	0
24	0	.....	.....	97	106	105	105	97	93	43	0
25	0	.....	.....	97	106	105	105	97	89	43	0
26	0	.....	.....	97	105	105	105	97	93	43	0
27	0	.....	.....	97	105	105	105	101	89	43	0
28	0	.....	.....	97	105	105	105	97	89	43	0
29	0	.....	.....	97	105	105	105	97	89	45	0
30	0	.....	.....	97	105	105	105	97	89	43	0
31	0	.....	.....	.....	105	.....	105	97	.....	43	.....

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge interpolated Apr. 1 and Nov. 11. Discharge estimated Sept. 5.

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Monthly discharge of Stanislaus Water Co.'s canal at Knights Ferry, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	75	0	28.5	1,750	B.
February	0	0	.0	0	A.
March	0	0	.0	0	A.
April	97	4	78.8	4,690	A.
May	105	97	103	6,330	A.
June	105	105	105	6,250	A.
July	113	64	106	6,520	A.
August	105	97	100	6,150	A.
September	101	0	85.2	5,070	A.
October	89	43	66.0	4,060	A.
November	10	0	3.5	208	C.
December	0	0	.0	0	A.
The year	113	0	56.7	41,000	

ROSE CREEK NEAR JUPITER, CAL.

Location.—Just above bridge at trail bridge in the SE. ¼ sec. 17, T. 3 N., R. 15 E., in the Stanislaus National Forest, about 2 miles northwest of Jupiter, about 2¾ miles above the junction with Stanislaus River. Eagle Creek enters 1½ miles above and Knight Creek 2½ miles below the station.

Records available.—September 8, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a tree on right bank, 100 feet above the bridge.

Channel.—Gravel and small bowlders.

Discharge measurements.—Made by wading. No measurements were made during 1911.

Cooperation.—Gage height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

Daily gage height, in feet, of Rose Creek near Jupiter, Cal., for 1911.

[Oliver P. Brownlow, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1						0.82						
2					1.02	.82						
3												
4												
5				2.80								
6		2.60			1.05							0.62
7	0.49											
8						.79						.52
9												
10				1.55				0.52				
11					.92						0.50	
12		1.30					0.52					.50
13							.48			0.25	.45	
14				1.38		.70	.49	.28			.47	
15			1.75		.82			.25				
16												.49
17	1.02	1.35										
18												
19						.58					.43	
20		1.25										
21				1.20				.25				
22												
23	1.45				.85				0.25			
24				1.09	.84							
25				1.09		.62						
26					.82				.30			
27												
28	1.60											
29												
30												
31			1.60				.28					

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KNIGHT CREEK NEAR JUPITER, CAL.

Location.—At trail ford in the SE. ¼ sec. 8, T. 3 N., R. 15 E., in the Stanislaus National Forest, about 5 miles west of Jupiter. Knight Creek joins Rose Creek about 2 miles below the station.

Records available.—September 9, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on right bank, 10 feet above trail crossing.

Channel.—Gravel and sand and is smooth.

Discharge measurements.—Made by wading. No measurements were made in 1911.

Diversions.—A small amount of water is diverted for irrigation above the station.

Cooperation.—Gage height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

Daily gage height, in feet, of Knight Creek near Jupiter, Cal., for 1911.

[H. C. Summers, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1					0.65	0.4				0.1		
2		3.0	1.7				0.3	0.1			0.2	0.45
3												
4					.6							
5	0.5					.35	.35				.25	
6												.45
7			2.1		.65			.1				
8						.35	.35				.3	
9												
10	2.0	1.6	2.0		.6					.2		
11				1.1								.45
12												
13	1.6				.6		.1					
14										.2	.3	
15			1.9									
16				1.1	.55							.45
17		1.8		.8			.1			.2	.35	
18	.8		1.2			.35						
19					.6							.5
20				.8			.1					
21	3.4					.35				.2	.35	
22					.5							.45
23												
24	3.0			.8								
25			1.2			.35	.1					
26					.5					.2	.4	.5
27		1.2		.8					0.1			
28												
29	3.4											.5
30			1.6	.65		.35	.1				.45	
31					.5					.2		

NOTE.—Water below gage from about Aug. 11 to about Sept. 26.

SOUTH FORK OF STANISLAUS RIVER NEAR CONFIDENCE, CAL.

Location.—At the Sonora-Bridgeport State highway bridge at Strawberry, in the Stanislaus National Forest, in the SE. ¼ sec. 17, T. 4 N., R. 18 E., 1½ miles below mouth of Herring Creek and 15 miles northeast of Confidence.

Records available.—October 20 to December 31, 1911.

Drainage area.—About 54 square miles.

Gage.—Vertical staff on left bank at bridge.

Channel.—Gravel and bowlders.

Discharge measurements.—Made from bridge at gage and by wading.

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Winter flow.—Probably affected by ice.

Diversions and storage.—Three storage reservoirs have been constructed above the station to supply Tuolumne and Sonora with water for domestic use. This water is diverted about 10 miles below the station. Flow is partially regulated by storage.

Cooperation.—Discharge measurements furnished by United States Forest Service.

The following discharge measurement was made by H. J. Tompkins by wading 20 feet below the gage:

October 20, 1911: Gage height, 1.35 feet; discharge, 8.7 second-feet.

Daily gage height, in feet, of South Fork of Stanislaus River near Confidence, Cal., for 1911.

[Charles Count, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	1.65	1.2	11	.....	1.48	1.2	21	1.80	1.30	1.2
2	.....	1.70	1.2	12	.....	1.45	1.2	22	1.78	1.30	1.2
3	.....	1.60	1.2	13	.....	1.48	1.2	23	1.72	1.25	1.2
4	.....	1.62	1.2	14	.....	1.50	1.2	24	1.70	1.25	1.2
5	.....	1.60	1.2	15	.....	1.60	1.2	25	1.70	1.25	1.2
6	.....	1.52	1.22	16	.....	1.35	1.2	26	1.70	1.25	1.2
7	.....	1.52	1.2	17	.....	1.45	1.2	27	1.68	1.22	1.2
8	.....	1.50	1.2	18	.....	1.30	1.2	28	1.62	1.2	1.2
9	.....	1.50	1.2	19	.....	1.35	1.2	29	1.62	1.2	1.2
10	.....	1.50	1.2	20	.....	1.30	1.2	30	1.60	1.2	1.2
								31	1.62	.....	1.2

SOUTH FORK OF STANISLAUS RIVER NEAR COLUMBIA, CAL.

Location.—At highway bridge at Italian Bar, in the Stanislaus National Forest, in the SE. ¼ sec. 33, T. 3 N., R. 15 E., about 5 miles northeast of Columbia. Deer Creek enters about 4½ miles above and Fivemile Creek 1½ miles below the station.

Records available.—September 6, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to middle pier of bridge.

Channel.—Solid rock, bowlders, and gravel.

Discharge measurements.—Made from bridge when not possible to wade. No measurements were made during 1911.

Diversions.—About 11 miles above the station water is diverted for domestic use at Sonora and Tuolumne. Flow is partially regulated by storage.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Estimates are withheld until additional measurements are available.

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Daily gage height, in feet, of South Fork of Stanislaus River near Columbia, Cal., for 1911.

[Oliver P. Brownlow, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1		5.50		3.50		3.80						
2	0.65	3.60		4.10	2.80							
3					2.40			1.28			0.65	
4					3.10			1.18				
5						4.10		1.00			.55	
6							4.20	.90				
7	.65	2.50			2.70							
8								1.28				
9			5.50			3.90						
10	1.10	2.00		3.30		4.20						
11		2.10		2.80			3.08					
12								.82	0.55			
13					3.10							
14		1.90				4.80			.55			
15			2.70					.55				
16	1.20											
17		1.65	3.40	2.70		5.00					.60	
18			2.40									
19				3.40								
20		1.65			3.05	5.20						
21												0.55
22			2.40							0.55		
23				3.05	4.30						.55	
24			2.40			4.80						.50
25								.50				
26				2.80								
27					3.40			.50			.55	
28					4.00		1.82					
29			2.80		3.60	4.30						.57
30			3.40						.55			
31	a7.25		3.50		4.00							

a Estimated.

CALAVERAS RIVER AT JENNY LIND, CAL.

Location.—At highway bridge on Milton road, in the SE. ¼ sec. 22, T. 3 N., R. 10 E., about one-fourth mile southeast of Jenny Lind and 27 miles above junction with San Joaquin River. North and South forks unite about 15 miles above the station.

Records available.—January 1 to June 30, 1907; December 1, 1907, to June 30, 1908; and November 1, 1908, to December 31, 1911.

Drainage area.—395 square miles.

Gage.—Vertical staff in two sections.

Channel.—Gravel and small bowlders and shifts considerably at high stages.

Discharge measurements.—Made from bridge at gage and by wading.

Accuracy.—Results for 1911 are only fair on account of change in channel during high water.

Cooperation.—Gage-height record during the high-water season, December to June, is furnished by the United States Weather Bureau through N. R. Taylor, local forecaster.

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Discharge measurements of Calaveras River at Jenny Lind, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 13	J. E. Stewart	6.15	10,600
14	.....do	3.70	3,420
Feb. 23	.....do	1.24	467
Mar. 8	.....do	8.40	29,000
8	.....do	8.75	32,400
May 18[a]	.....do	.44	205
July 28[b]	.....do	−.30	19
Dec. 1[c]	F. C. Ebert	−.13	43
1[c]	Lasley Lee	−.13	43

[a] Measurement made by wading 500 feet below gage.
[b] Measurement made by wading one-fourth mile above gage.
[c] Measurement made from foot-log 30 feet above gage.

Daily gage height, in feet, of Calaveras River at Jenny Lind, Cal., for 1911.

[Paul F. Sinclair, observer.]

Day	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.0	5.0	2.0	1.0	0.7	0.3	0.0	−0.3	−0.45	−0.2	−0.1	0.0
2	.0	3.2	2.7	1.0	.7	.3	.0	−.35	−.45	−.2	−.1	.0
3	.0	2.8	2.1	1.0	.6	.3	.0	−.35	−.45	−.2	−.1	.0
4	.0	2.6	4.65	1.0	.6	.2	.0	−.35	−.45	−.2	−.1	.0
5	.0	2.6	4.2	1.3	.6	.2	.0	−.35	−.45	−.2	−.1	.0
6	.0	2.4	3.4	2.5	.7	.2	−.1	−.4	−.45	−.2	−.1	.0
7	.0	2.0	8.65	2.1	.6	.2	−.1	−.4	−.45	−.2	−.1	.0
8	.0	1.8	7.5	1.3	.6	.2	−.1	−.4	−.45	−.2	−.1	.0
9	.0	1.6	5.0	1.3	.6	.2	−.1	−.4	−.45	−.2	−.1	.0
10	.3	1.5	4.0	2.0	.6	.2	−.15	−.4	−.45	−.2	.0	.0
11	.8	2.5	3.0	1.7	.6	.2	−.15	−.4	−.45	−.2	.0	.0
12	4.0	2.3	2.5	1.3	.5	.1	−.15	−.4	−.45	−.2	.0	.0
13	6.0	3.0	2.1	1.2	.5	.1	−.15	−.4	−.45	−.2	.0	.0
14	4.0	3.1	1.9	1.0	.5	.1	−.15	−.4	−.45	−.2	.0	.0
15	3.5	2.5	1.8	1.0	.4	.1	−.15	−.45	−.45	−.15	.0	.0
16	1.4	2.0	1.5	1.0	.4	.1	−.15	−.45	−.45	−.15	.0	.0
17	0.8	1.8	1.4	1.0	.4	.1	−.15	−.45	−.4	−.15	.0	+.1
18	.7	1.7	1.4	1.0	.4	.1	−.2	−.45	−.4	−.15	.0	.1
19	2.6	1.5	1.4	1.0	.4	.1	−.2	−.45	−.4	−.15	.0	.1
20	3.6	1.4	1.4	.9	.4	.0	−.2	−.45	−.4	−.1	.0	.1
21	3.6	1.3	1.4	.9	.4	.0	−.2	−.45	−.3	−.1	.0	.1
22	2.6	1.3	1.3	.9	.3	.0	−.25	−.45	−.3	−.1	.0	.1
23	1.6	1.3	1.2	.9	.3	.0	−.25	−.45	−.3	−.1	.0	.1
24	5.0	1.3	1.2	.8	.3	.0	−.3	−.45	−.25	−.1	.0	.1
25	6.0	1.2	1.2	.8	.3	.0	−.3	−.45	−.2	−.1	.0	.1
26	3.5	1.1	1.1	.8	.3	.0	−.3	−.45	−.2	−.1	.0	.1
27	3.3	1.2	1.1	.8	.3	.0	−.3	−.45	−.2	−.1	.0	.1
28	2.5	1.3	1.0	.8	.3	.0	−.3	−.45	−.2	−.1	.0	.1
29	2.8	.....	1.0	.8	.3	.0	−.3	−.45	−.2	−.1	.0	.1
30	10.0	.....	1.0	.7	.3	.0	−.3	−.45	−.2	−.1	.0	.2
31	14.0	.....	1.0	.....	.3	.....	−.3	−.45	.....	−.1	.....	.2

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Daily discharge, in second-feet, of Calaveras River at Jenny Lind, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	51	7,930	1,130	470	305	142	64	21	10	32	46	64
2	51	2,860	2,020	470	305	142	64	17	10	32	46	64
3	51	2,170	1,240	470	258	142	64	17	10	32	46	64
4	51	1,870	6,640	470	258	112	64	17	10	32	46	64
5	51	1,870	5,210	665	258	112	64	17	10	32	46	64
6	51	1,600	3,250	1,980	305	112	46	13	10	32	46	64
7	51	1,130	31,200	1,450	258	112	46	13	10	32	46	64
8	51	935	22,500	665	258	112	46	13	10	32	46	64
9	51	750	8,360	665	258	112	46	13	10	32	46	64
10	110	665	5,040	1,330	258	112	39	13	10	32	64	64
11	246	1,730	2,800	1,020	258	112	39	13	10	32	64	64
12	4,040	1,470	1,980	665	215	86	39	13	10	32	64	64
13	10,000	2,500	1,450	595	215	86	39	13	10	32	64	64
14	4,040	2,680	1,220	470	215	86	39	13	10	32	64	64
15	3,040	1,730	1,120	470	176	86	39	10	10	39	64	64
16	557	1,130	830	470	176	86	39	10	10	39	64	64
17	246	935	745	470	176	86	39	10	13	39	64	86
18	214	840	745	470	176	86	32	10	13	39	64	86
19	1,670	665	745	470	176	86	32	10	13	39	64	86
20	3,230	585	745	411	176	64	32	10	13	46	64	86
21	3,230	510	745	411	176	64	32	10	21	46	64	86
22	1,670	510	665	411	142	64	26	10	21	46	64	86
23	700	510	595	411	142	64	26	10	21	46	64	86
24	6,630	510	595	356	142	64	21	10	26	46	64	86
25	10,000	440	595	356	142	64	21	10	32	46	64	86
26	3,040	370	530	356	142	64	21	10	32	46	64	86
27	2,690	440	530	356	142	64	21	10	32	46	64	86
28	1,550	510	470	356	142	64	21	10	32	46	64	86
29	1,930	.....	470	356	142	64	21	10	32	46	64	86
30	34,100	.....	470	305	142	64	21	10	32	46	64	112
31	69,600	.....	470	.....	142	.....	21	10	.....	46	.....	112

NOTE.—Daily discharge determined from three rating curves applicable Jan. 1, 1910, to Jan. 31, 1911, Feb. 1 to Mar. 6, and Mar. 7 to Dec. 31. These curves are fairly defined at low stages, but at medium and high stages they are poor.

Monthly discharge of Calaveras River at Jenny Lind, Cal., for 1911.

[Drainage area, 395 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	69,600	51	5,260	13.3	15.33	323,000	C.
February	7,930	370	1,420	3.59	3.74	78,900	B.
March	31,200	470	3,390	8.58	9.89	208,000	C.
April	1,980	305	594	1.50	1.67	35,300	C.
May	305	142	202	.511	.59	12,400	B.
June	142	64	90.5	.229	.26	5,390	B.
July	64	21	37.5	.095	.11	2,310	C.
August	21	10	12.1	.031	.04	744	C.
September	32	10	16.4	.042	.05	976	C.
October	46	32	38.5	.098	.11	2,370	C.
November	64	46	58.6	.148	.17	3,490	C.
December	112	64	76.3	.193	.22	4,690	C.
The year	69,600	10	937	2.37	32.18	678,000	

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MOKELUMNE RIVER NEAR CLEMENTS, CAL.

Location.—At highway bridge in the NW. ¼ sec. 15, T. 4 N., R. 8 E., about 1 mile north of Clements. The North and Middle forks of the Mokelumne unite about 35 miles above Clements. Cosumnes River enters about 19½ miles below the station.

Records available.—October 28, 1904, to December 31, 1911.

Drainage area.—642 square miles.

Gage.—Painted on middle bridge pier with inclined section for low water on the right bank.

Channel.—Sand and gravel which shift but little.

Discharge measurements.—Made from bridge at gage or by wading.

Diversions.—Several small diversions for mining and local irrigation above the station. Power is developed on the North Fork and part of the water is not returned to the stream. Flow is partly regulated by storage.

Accuracy.—Results are good.

Discharge measurements of Mokelumne River near Clements, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 15	J. E. Stewart	7.56	2,290
Feb. 22	.....do	5.65	1,030
Mar. 7	.....do	13.00	9,120
May 17	.....do	7.90	2,730
July 29	.....do	4.54	476
Sept. 20	.....do	3.84	245

Daily gage height, in feet, of Mokelumne River near Clements, Cal., for 1911.

[Reba Gaskill, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.05	12.8	6.25	9.4	8.35	9.4	10.2	4.45	3.55	3.95	3.25	3.5
2	3.9	10.0	6.8	9.7	8.35	9.9	8.7	4.35	3.4	4.05	3.5	3.35
3	3.85	9.1	7.7	10.4	8.25	10.05	8.85	4.35	3.4	3.65	3.35	3.45
4	3.95	8.75	8.15	10.25	9.6	10.3	8.6	4.35	3.3	3.55	3.5	3.3
5	4.05	8.6	8.0	10.6	10.2	11.7	8.15	4.3	3.45	3.5	3.3	3.35
6	4.15	8.25	7.9	11.4	9.7	12.2	8.3	4.4	3.4	3.55	3.6	3.25
7	4.05	8.5	11.75	10.65	9.3	10.9	8.2	.....	3.5	3.4	3.6	3.2
8	3.95	7.9	11.45	10.7	9.25	10.15	7.85	.....	3.6	3.6	3.5	3.3
9	3.8	7.8	10.5	10.25	9.35	10.5	7.6	.....	3.5	3.35	3.65	3.35
10	4.7	7.6	9.7	9.65	9.5	11.55	7.45	.....	3.35	3.15	3.4	3.35
11	5.1	7.4	8.45	9.5	9.45	11.95	7.45	3.95	3.5	3.35	4.3	3.3
12	6.55	7.15	8.05	8.8	9.35	12.25	7.25	3.8	3.45	3.35	4.2	3.45
13	8.85	7.35	7.9	9.0	.....	11.5	7.35	3.85	3.35	3.25	3.95	3.25
14	8.0	7.65	7.4	9.35	9.05	11.2	7.5	3.75	3.3	3.3	3.8	3.3
15	8.9	7.55	7.35	8.75	9.15	10.95	.....	3.85	3.4	3.25	.....	3.5
16	5.6	7.35	7.8	8.5	8.5	11.45	7.4	3.8	3.25	3.25	.....	3.45
17	5.0	7.1	8.25	8.45	7.9	11.75	7.3	3.7	3.25	3.4	3.65	3.6
18	4.75	6.4	8.25	8.05	8.1	12.3	6.7	3.75	3.4	3.55	3.7	3.55
19	5.0	6.0	8.55	8.6	8.1	11.15	6.1	3.7	3.5	3.3	3.8	3.35
20	7.0	5.8	8.3	8.25	8.7	10.75	5.7	3.8	3.65	3.1	3.6	3.35
21	6.75	6.3	8.0	8.6	9.5	10.8	5.35	3.7	3.6	3.1	3.65	3.25
22	6.0	6.7	7.75	8.9	10.45	10.15	5.3	3.7	3.7	3.0	3.75	3.2
23	5.95	7.25	7.6	9.25	11.85	9.55	5.2	3.6	3.45	3.35	3.8	3.2
24	8.55	7.05	7.95	9.7	11.95	8.95	.....	3.75	3.65	3.3	3.9	3.35
25	10.35	6.7	8.15	10.35	11.1	8.3	.....	3.65	3.5	3.35	3.75	3.35
26	8.9	6.65	8.35	9.9	10.05	8.6	.....	3.7	3.45	3.6	3.65	3.25
27	7.05	6.2	8.6	9.75	9.7	8.75	.....	3.7	3.65	3.2	3.6	3.25
28	6.6	5.9	8.8	9.1	9.5	8.8	.....	3.75	3.45	3.35	3.65	3.35
29	8.55	.....	8.95	8.6	9.35	8.6	4.5	3.65	3.65	3.55	3.55	3.4
30	17.45	.....	9.2	8.35	8.85	8.9	4.5	3.45	3.65	3.4	3.45	3.7
31	17.4	.....	.....	.....	8.55	.....	4.5	3.45	.....	3.2	.....	3.8

NOTE.—Gage heights Jan. 10–15, 19–21, Jan. 23 to Feb. 2, and Mar. 6–7 determined by means of graph.

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Daily discharge, in second-feet, of Mokelumne River near Clements, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	217	8,800	1,430	4,240	3,150	4,240	5,160	445	170	275	112	160
2	181	4,920	1,820	4,570	3,150	4,800	3,500	408	140	305	160	130
3	170	3,910	2,550	5,400	3,050	4,980	3,650	408	140	192	130	150
4	192	3,550	2,960	5,220	4,460	5,280	3,400	408	120	170	160	120
5	217	3,400	2,820	5,660	5,160	7,140	2,960	390	150	160	120	130
6	244	3,050	2,730	6,720	4,570	7,880	3,100	425	140	170	180	112
7	217	3,300	7,210	5,720	4,130	6,050	3,000	395	160	140	180	105
8	192	2,730	6,790	5,790	4,080	5,100	2,680	365	180	180	160	120
9	159	2,640	5,530	5,220	4,180	5,530	2,460	335	160	130	192	130
10	433	2,460	4,570	4,520	4,350	6,930	2,330	305	130	98	140	130
11	610	2,290	3,250	4,350	4,300	7,500	2,330	275	160	130	390	120
12	1,520	2,090	2,860	3,600	4,180	7,960	2,170	230	150	130	355	150
13	3,500	2,250	2,730	3,800	4,020	6,860	2,250	245	130	112	275	112
14	2,680	2,500	2,290	4,190	3,860	6,440	2,370	218	120	120	230	120
15	3,560	2,420	2,250	3,550	3,960	6,120	2,330	245	140	112	217	160
16	890	2,250	2,640	3,300	3,300	6,790	2,290	230	112	112	205	150
17	565	2,050	3,050	3,250	2,730	7,210	2,210	205	112	140	192	180
18	454	1,520	3,050	2,860	2,910	8,030	1,740	218	140	170	205	170
19	565	1,250	3,350	3,400	2,910	6,380	1,320	205	160	120	230	130
20	1,860	1,120	3,100	3,050	3,500	5,860	1,060	230	192	90	180	130
21	1,660	1,460	2,820	3,400	4,350	5,920	858	205	180	90	192	112
22	1,130	1,740	2,600	3,700	5,460	5,100	830	205	205	75	218	105
23	1,100	2,170	2,460	4,080	7,360	4,400	780	180	150	130	230	105
24	3,200	2,010	2,780	4,570	7,500	3,750	717	218	192	120	260	130
25	5,240	1,740	2,960	5,340	6,310	3,100	654	192	160	130	218	130
26	3,560	1,710	3,150	4,800	4,980	3,400	591	205	150	180	192	112
27	1,900	1,380	3,400	4,620	4,570	3,550	528	205	192	105	180	112
28	1,550	1,180	3,600	3,910	4,350	3,600	465	218	150	130	192	130
29	3,200	.....	3,750	3,400	4,180	3,400	465	192	192	170	170	140
30	16,700	.....	4,020	3,150	3,650	3,700	465	150	192	140	150	205
31	16,600	.....	4,130	.....	3,350	.....	465	150	.....	105	.....	230

NOTE.—Daily discharge determined from two well-defined rating curves applicable Jan. 1 to 31 and Feb. 1 to Dec. 31. Discharge interpolated for days on which gage was not read.

Monthly discharge of Mokelumne River near Clements, Cal., for 1911.

[Drainage area, 642 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	16,700	159	2,400	3.74	4.31	148,000
February	8,800	1,120	2,570	4.00	4.16	143,000
March	7,210	1,430	3,310	5.16	5.95	204,000
April	6,720	2,860	4,310	6.71	7.49	256,000
May	7,500	2,730	4,260	6.64	7.66	262,000
June	8,030	3,100	5,570	8.68	9.68	331,000
July	5,160	465	1,910	2.98	3.44	117,000
August	445	150	268	.417	.48	16,500
September	205	112	156	.243	.27	9,280
October	305	75	143	.223	.26	8,790
November	390	112	200	.312	.35	11,900
December	230	105	136	.212	.24	8,360
The year	16,700	75	2,090	3.26	44.29	1,520,000

NOTE.—Accuracy for the year A, except as affected by somewhat poor gage readings.

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MIDDLE FORK OF MOKELUMNE RIVER NEAR WEST POINT, CAL.

Location.—Above highway bridge, in sec. 10, T. 6 N., R. 13 E., 3½ miles above junction with the South Fork, 1¼ miles below mouth of Bear Creek and 1 mile south of Westpoint.

Records available.—October 9 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections fastened to trees on right bank, 1,000 feet above bridge.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from car and cable one-half mile above gage and by wading.

Diversions.—Mokelumne Hill and Valley Springs ditch (capacity, about 6 second-feet) diverts about 2 miles above the station.

Discharge measurements of Middle Fork of Mokelumne River near West Point, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 9[a]	F. C. Ebert	3.10	16
Nov. 24[b]	....do	3.00	12

[a] Made by wading 150 feet above gage. [b] Made by wading ¼ mile above gage.

Daily gage height, in feet, of Middle Fork of Mokelumne River near West Point, Cal., for 1911.

[Clarence Sorensen, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	2.99	2.95	11	3.04	3.06	2.99	21	2.93	3.00	3.10
2	.....	2.99	2.95	12	3.04	3.04	2.99	22	2.95	3.00	3.10
3	.....	2.92	2.95	13	3.00	3.03	3.00	23	3.01	3.00	3.10
4	.....	2.95	2.95	14	3.00	3.01	3.00	24	.....	3.00	3.07
5	.....	2.93	2.95	15	3.00	3.01	3.00	25	.....	2.99	3.34
6	.....	2.92	3.00	16	2.99	3.01	3.00	26	.....	3.00	3.34
7	.....	2.94	3.00	17	2.99	3.01	3.00	27	.....	2.95	3.28
8	.....	2.95	2.98	18	2.99	3.01	3.01	28	.....	2.95	3.28
9	3.10	3.60	2.98	19	2.98	3.00	3.01	29	.....	2.95	3.28
10	3.08	3.12	2.99	20	2.95	3.00	3.10	30	3.00	2.95	3.28
								31	2.99	.....	3.30

SOUTH FORK OF MOKELUMNE RIVER NEAR RAILROAD FLAT, CAL.

Location.—At Laidet ranch, in sec. 34, T. 6 N., R. 14 E., about 5 miles above mouth of Licking Fork and 5 miles east of Railroad Flat.

Records available.—October 23 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to alder tree on right bank 100 feet above suspension footbridge.

Channel.—Gravel.

Discharge measurements.—Made from car and cable 150 feet below gage or by wading.

Diversions.—An irrigation and power ditch, having a capacity of about 2 second-feet, diverts at base of Blue Mountain, above the station. Some water is also used for irrigation at Laidet ranch.

Cooperation.—Gage-height record furnished by United States Forest Service.

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Discharge measurements of South Fork of Mokelumne River near Railroad Flat, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 23[a]	H. J. Tompkins	1.18	7.6
Nov. 28[b]	Lasley Lee	1.19	7.4

[a] Made by wading 200 feet above gage. [b] Made by wading 200 feet below gage.

Daily gage height, in feet, of South Fork of Mokelumne River near Railroad Flat, Cal., for 1911.

[J. E. Elliott, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1				11				21			
2				12		1.20		22			
3		1.20	1.18	13				23	1.18	1.18	
4				14		1.20		24			
5				15			1.18	25			
6				16				26		1.18	
7			1.18	17				27			
8				18		1.10		28		1.19	
9				19				29			1.20
10		1.55	1.18	20				30		1.18	
								31			

LICKING FORK OF MOKELUMNE RIVER NEAR RAILROAD FLAT, CAL.

Location.—At Mokelumne Forest ranger station, in the E. ½ SE. ¼ sec. 26, T. 6 N., R. 14 E., 100 feet above mouth of Big Canyon Creek and 6½ miles east of Railroad Flat. Licking Fork joins the South Fork 6 miles below the station.

Records available.—October 23 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on left bank 300 feet above the ranger station.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from footlog near gage or by wading.

Diversions.—An irrigation ditch, having a capacity of 1 second-foot, heads above the station.

Cooperation.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Licking Fork of Mokelumne River at Railroad Flat, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 23[a]	H. J. Tompkins	0.50	1.6
Nov. 29[b]	Lasley Lee	.55	1.7

[a] Made by wading 10 feet below gage. [b] Made by wading 200 feet above gage.

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Daily gage height, in feet, of Licking Fork of Mokelumne River near Railroad Flat, Cal., for 1911.

[J. E. Elliott, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	.....	0.57	11	.....	0.60	0.57	21	.....	0.55	.....
2	.....	.....	.57	12	.....	.56	.57	22	.....	.55	.....
3	.....	0.50	.57	13	.....	.....	.57	23	0.50	.55	.....
4	.....	.52	.57	14	.....	.....	.57	24	.50	.55	.....
5	.....	.52	.57	15	.....	.57	.....	25	.49	.55	.....
6	.....	.52	.57	16	.....	.60	.....	26	.....	.55	.....
7	.....	.52	.57	17	.....	.58	.....	27	.....	.57	.....
8	.....	.52	.57	18	.....	.56	.....	28	.....	.57	.....
9	.....	.53	.57	19	.....	.....	.....	29	.....	.57	.....
10	.....	.80	.57	20	.....	.55	.....	30	.....	.57	0.60
								31	.....	.....	.60

DRY CREEK NEAR IONE, CAL.

Location.—At private highway bridge at Landis ranch, in southwestern part of Arroyo Seco grant, 2½ miles below mouth of Jackson Creek and 7 miles southwest of Ione.

Records available.—October 7 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections. Lower section is fastened to bridge pier near right bank and upper section to a tree 300 feet to the right of bridge.

Channel.—Sand, and will shift during high water.

Discharge measurements.—Made from bridge or by wading.

Diversions.—Small diversions for local irrigation and mining above the station. There is a small diversion from the North Fork of Mokelumne River into this drainage basin.

The following discharge was estimated by F. C. Ebert:
October 7, 1911: Gage height, 1.67 feet; discharge, 0.2 second-foot.

Daily gage height, in feet, of Dry Creek near Ione, Cal., for 1911.

[Chas. W. Landis, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	2.0	2.0	11	1.8	2.7	2.0	21	1.8	2.1	2.1
2	.....	1.9	2.0	12	1.8	2.2	2.0	22	1.7	2.1	2.0
3	.....	1.9	2.0	13	1.8	2.3	2.0	23	1.7	2.0	2.0
4	.....	1.9	2.0	14	1.8	2.1	2.0	24	1.8	2.0	2.0
5	.....	1.9	2.0	15	1.8	2.0	2.0	25	1.8	2.0	2.0
6	.....	1.8	2.0	16	1.8	2.0	2.0	26	1.8	2.0	2.0
7	1.5	1.8	2.0	17	1.8	2.0	2.2	27	1.8	2.0	2.0
8	1.7	1.9	2.0	18	1.8	2.0	2.2	28	1.8	2.0	2.6
9	1.6	1.9	2.0	19	1.8	2.1	2.1	29	1.9	2.0	2.4
10	1.8	2.5	2.0	20	1.8	2.1	2.1	30	2.6	2.0	2.2
								31	1.9	.....	2.2

NOTE.—Creek dry July 11 to Oct. 6.

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COSUMNES RIVER AT MICHIGAN BAR, CAL.

Location.—At highway bridge at Michigan Bar, in the NW. ¼ SE. ¼ sec. 36, T. 8 N., R. 8 E., 5½ miles southwest of Latrobe. The North and Middle forks unite 12 miles above the station.

Records available.—October 20, 1907, to December 31, 1911.

Drainage area.—524 square miles.

Gage.—Vertical staff on downstream end of bridge pier, near left bank.

Channel.—Sand, gravel, and small bowlders which shift somewhat.

Discharge measurements.—Made from bridge at gage and by wading.

Diversions.—A few small ditches take water for use in irrigation and mining.

Accuracy.—Conditions are favorable for making good discharge measurements at all stages. Results are good.

Discharge measurements of Cosumnes River at Michigan Bar, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 14	H. D. McGlashan	7.65	8,740
Feb. 1	....do	7.95	9,830
Mar. 31	J. E. Stewart	5.50	2,570
Aug. 10[a]	F. C. Ebert	2.55	39
Oct. 2[b]	J. E. Stewart	2.55	40

[a] Measurement made by wading 300 feet above gage.
[b] Measurement made by mading 150 feet above gage.

Daily gage height, in feet, of Cosumnes River at Michigan Bar, Cal., for 1911.

[C. B. Ruman, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.00	7.80	4.50	5.60	4.80	4.50	3.62	2.70	2.30	2.50	2.60	2.70
2	2.95	6.60	4.65	5.75	4.80	4.45	3.60	2.62	2.30	2.58	2.60	2.70
3	2.97	6.05	5.15	5.78	4.80	4.50	3.60	2.60	2.30	2.70	2.60	2.70
4	3.00	6.00	6.35	5.70	4.85	4.55	3.60	2.60	2.30	2.70	2.60	2.70
5	3.00	5.70	6.30	6.10	5.08	4.50	3.50	2.60	2.32	2.70	2.60	2.72
6	3.00	5.65	6.20	6.60	4.95	4.50	3.50	2.60	2.35	2.75	2.60	2.80
7	3.00	5.30	9.05	6.10	4.90	4.58	3.50	2.60	2.35	2.70	2.60	2.80
8	3.00	5.05	7.80	5.85	4.80	4.58	3.40	2.60	2.38	2.68	2.60	2.85
9	3.32	4.95	6.95	5.88	4.75	4.50	3.40	2.60	2.35	2.62	2.60	2.80
10	4.30	4.82	6.65	6.00	4.72	4.42	3.30	2.55	2.35	2.70	2.70	2.80
11	3.95	5.75	6.10	5.55	4.70	4.50	3.28	2.54	2.35	2.70	3.32	2.80
12	7.60	5.05	5.80	5.42	4.75	4.50	3.30	2.50	2.35	2.62	3.00	2.75
13	7.70	5.75	5.50	5.20	4.72	4.42	3.25	2.50	2.40	2.60	2.85	2.75
14	7.75	5.35	5.45	5.05	4.70	4.38	3.20	2.50	2.40	2.60	2.80	2.75
15	6.05	5.05	5.25	5.00	4.68	4.30	3.15	2.50	2.45	2.60	2.80	2.78
16	4.70	4.85	5.20	5.00	4.60	4.30	3.10	2.50	2.40	2.60	2.80	2.80
17	4.30	4.75	5.10	5.00	4.60	4.30	3.10	2.50	2.35	2.58	2.95	2.80
18	4.10	4.65	5.10	5.00	4.52	4.28	3.05	2.50	2.35	2.50	2.89	2.90
19	4.35	4.60	5.10	5.08	4.50	4.25	3.00	2.45	2.35	2.50	2.80	2.80
20	6.70	4.55	5.15	5.08	4.50	4.22	3.00	2.42	2.35	2.50	2.80	2.80
21	6.20	4.45	5.20	5.08	4.50	4.10	2.92	2.40	2.35	2.50	2.80	2.80
22	5.05	4.40	5.20	5.12	4.60	4.02	2.90	2.40	2.35	2.50	2.80	2.72
23	4.70	4.40	5.25	5.20	4.72	3.95	2.90	2.40	2.35	2.50	2.79	2.80
24	7.55	4.35	5.25	5.20	4.80	3.88	2.90	2.36	2.35	2.50	2.75	2.85
25	7.55	4.30	5.25	5.35	4.65	3.82	2.88	2.35	2.40	2.50	2.70	2.80
26	6.70	4.28	5.25	5.38	4.60	3.80	2.80	2.35	2.50	2.50	2.74	2.70
27	5.65	4.30	5.25	5.28	4.50	3.80	2.80	2.35	2.50	2.50	2.80	2.70
28	5.70	4.30	5.28	5.10	4.50	3.80	2.75	2.35	2.50	2.55	2.70	3.00
29	7.95	.....	5.28	4.95	4.50	3.72	2.72	2.35	2.50	2.65	2.70	3.00
30	10.50	.....	5.42	4.80	4.50	3.68	2.70	2.35	2.50	2.60	2.70	2.90
31	10.90	.....	5.52	.....	4.52	.....	2.70	2.32	.....	2.60	.....	2.99

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Daily discharge, in second-feet, of Cosumnes River at Michigan Bar, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	63	9,280	1,050	2,760	1,410	1,050	310	53	24	35	43	53
2	54	5,320	1,220	3,100	1,410	995	300	45	24	41	43	53
3	58	3,820	1,940	3,160	1,410	1,050	300	43	24	53	43	53
4	63	3,700	4,610	2,980	1,490	1,100	300	43	24	53	43	53
5	63	2,980	4,470	3,950	1,830	1,050	255	43	25	53	43	56
6	63	2,870	4,210	5,320	1,620	1,050	255	43	26	60	43	66
7	63	2,190	14,100	3,950	1,550	1,140	255	43	26	53	43	66
8	63	1,780	9,280	3,330	1,410	1,140	215	43	28	51	43	74
9	136	1,620	6,390	3,400	1,340	1,050	215	43	26	45	43	66
10	770	1,440	5,470	3,700	1,310	962	180	39	26	53	53	66
11	466	3,100	3,950	2,660	1,280	1,050	174	38	26	53	187	66
12	8,560	1,780	3,210	2,410	1,340	1,050	180	35	26	45	180	60
13	8,920	3,100	2,560	2,020	1,310	962	165	35	29	43	74	60
14	9,100	2,280	2,460	1,780	1,280	920	150	35	29	43	66	60
15	3,820	1,780	2,100	1,700	1,260	840	136	35	32	43	66	63
16	1,250	1,480	2,020	1,700	1,160	840	123	35	29	43	66	66
17	770	1,340	1,860	1,700	1,160	840	123	35	26	41	92	66
18	588	1,220	1,860	1,700	1,070	820	112	35	26	35	80	82
19	820	1,160	1,860	1,830	1,050	790	101	32	26	35	66	66
20	5,620	1,100	1,940	1,830	1,050	760	101	30	26	35	66	66
21	4,210	995	2,020	1,830	1,050	650	86	29	26	35	66	66
22	1,780	940	2,020	1,890	1,160	578	82	29	26	35	66	56
23	1,250	940	2,100	2,020	1,310	520	82	29	26	35	65	66
24	8,380	890	2,100	2,020	1,410	466	82	27	26	35	60	74
25	8,380	840	2,100	2,280	1,220	424	79	26	29	35	53	66
26	5,620	820	2,100	2,330	1,160	410	66	26	35	35	58	53
27	2,870	840	2,100	2,160	1,050	410	66	26	35	35	66	53
28	2,980	840	2,160	1,860	1,050	410	60	26	35	39	53	101
29	9,820	.....	2,160	1,620	1,050	362	56	26	35	48	53	101
30	20,600	.....	2,410	1,410	1,050	340	53	26	35	43	53	82
31	22,400	.....	2,600	.....	1,070	.....	53	25	.....	43	.....	99

NOTE.—Daily discharge determined from two fairly well-defined rating curves applicable Jan. 1, 1910, to Jan. 31, 1911, and Feb. 1 to Dec. 31, 1911.

Monthly discharge of Cosumnes River at Michigan Bar, Cal., for 1911.

[Drainage area, 524 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	22,400	54	4,180	7.98	9.20	257,000	A.
February	9,280	820	2,160	4.12	4.29	120,000	A.
March	14,100	1,050	3,240	6.18	7.12	199,000	A.
April	5,320	1,410	2,480	4.73	5.28	148,000	A.
May	1,830	1,050	1,270	2.42	2.79	78,100	B.
June	1,140	340	801	1.53	1.71	47,700	B.
July	310	53	152	.290	.33	9,350	B.
August	53	25	34.8	.066	.08	2,140	B.
September	35	24	27.9	.053	.06	1,660	C.
October	60	35	42.9	.082	.09	2,640	B.
November	187	43	65.9	.126	.14	3,920	B.
December	101	53	67.0	.128	.15	4,120	B.
The year	22,400	24	1,210	2.31	31.24	874,000	

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NORTH FORK OF COSUMNES RIVER NEAR EL DORADO, CAL.

Location.—At suspension footbridge at Celio's ranch [1] in sec. 23, T. 9 N., R. 10 E., 5 miles south of El Dorado and 4 miles above junction with Middle Fork. Martinez Creek enters about 1½ miles above the station.
Records available.—August 13 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Staff in three sections on right bank at the bridge.
Channel.—Gravel and solid rock.
Discharge measurements.—Made from bridge or by wading.

Discharge measurements of North Fork of Cosumnes River near El Dorado, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 13[a]	F. C. Ebert	3.38	28
Sept. 23[b]	do	3.25	20

[a] Made by wading 500 feet below gage. [b] Made by wading 250 feet above gage.

Daily gage height, in feet, of North Fork of Cosumnes River near El Dorado, Cal., for 1911.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1		3.2	3.32			16	3.3	3.3		3.7	3.45
2				3.4	3.5	17			3.35		3.55
3		3.2	3.45		3.5	18				3.55	
4				3.4		19	3.3	3.2		3.55	3.5
5			3.5	3.4	3.5	20					
6		3.2				21	3.3			3.5	3.45
7			3.45	3.4	3.55	22	3.2	3.2	3.35		
8			3.4			23		3.25		3.45	3.5
9		3.2		3.45	3.5	24		3.25	3.4		3.5
10		3.2	3.45		3.45	25	3.2			3.45	
11				3.8		26				3.45	3.55
12		3.3		3.65	3.45	27	3.2		3.4		
13	3.4		3.4			28		3.3	3.5	3.5	3.7
14			3.4	3.5	3.45	29			3.5		
15			3.4			30	3.2	3.3			3.6
						31			3.45		3.6

SACRAMENTO RIVER BASIN.

SACRAMENTO RIVER AT CASTELLA, CAL.

Location.—At the private highway bridge at Castella, in sec. 22, T. 38 N., R. 4 W., about half a mile below the mouth of Castle Creek.
Records available.—October 15, 1910, to December 31, 1911.
Drainage area.—257 square miles.
Gage.—Vertical staff on downstream end of bridge pier near right bank.
Channel.—Small bowlders; fairly permanent.
Discharge measurements.—Made from upstream side of bridge in 1911.
Accuracy.—Although the channel is a little rough, it is believed that good results will be obtained at this station. Sufficient measurements have not yet been made to define the rating curve.
Cooperation.—Gage-height record furnished by H. O. Wickes.

[1] "Kings Store" on map of Placerville quadrangle published by United States Geological Survey.

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Discharge measurements of Sacramento River at Castella, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 8	G. T. Peekema	5.22	2,370
May 27	.....do	4.38	1,490
Sept. 1	.....do	2.55	249

Daily gage height, in feet, of Sacramento River at Castella, Cal., for 1911.

[H. O. Wickes, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.7	4.4	3.0	6.0	4.6	4.6	3.1	2.8	2.5	2.6	2.6	2.6
2	2.7	4.4	3.0	6.0	4.5	4.6	3.1	2.7	2.5	2.6	2.6	2.6
3	2.7	4.1	3.0	5.9	4.8	4.6	3.0	2.7	2.5	2.6	2.6	2.6
4	2.7	4.0	3.5	5.4	4.9	4.6	3.0	2.7	2.5	2.6	2.6	2.6
5	2.7	3.9	4.2	6.2	5.8	4.5	3.0	2.7	2.5	2.6	2.6	2.8
6	2.7	3.8	6.5	5.3	4.9	4.5	3.0	2.7	2.5	2.6	2.6	2.7
7	2.7	3.7	5.5	5.2	4.8	4.4	3.0	2.7	2.5	2.6	2.6	2.6
8	2.7	3.5	5.5	5.2	4.8	4.3	3.0	2.6	2.5	2.6	2.6	2.6
9	2.8	3.4	4.4	5.6	4.5	4.2	3.0	2.6	2.5	2.8	2.6	2.6
10	2.7	3.5	4.1	4.9	4.5	4.2	3.0	2.6	2.5	2.7	2.7	2.6
11	2.6	3.6	4.0	4.9	4.4	4.3	3.0	2.5	2.5	2.6	2.6	2.6
12	2.5	3.6	3.9	4.7	4.4	4.3	3.0	2.5	2.6	2.6	2.6	2.6
13	2.5	3.5	3.9	4.4	4.4	4.3	3.0	2.5	2.5	2.6	2.6	2.6
14	2.5	3.4	4.0	4.3	4.4	4.2	2.9	2.5	2.5	2.6	2.6	2.6
15	2.6	3.3	4.0	4.3	4.4	4.1	2.9	2.5	2.5	2.6	2.8	2.6
16	2.6	3.2	4.1	4.2	4.6	4.0	2.9	2.5	2.5	2.6	2.6	2.6
17	2.6	3.1	4.2	4.2	4.4	4.0	2.9	2.5	2.5	2.6	2.6	2.5
18	3.1	3.1	4.3	4.4	4.9	3.9	3.0	2.5	2.5	2.6	2.6	2.5
19	4.45	3.1	4.4	4.4	4.5	3.8	3.0	2.5	2.5	2.6	2.6	2.5
20	3.8	3.1	4.5	4.5	4.5	3.8	2.9	2.5	2.5	2.6	2.6	2.5
21	3.2	3.1	4.6	4.5	4.4	3.8	2.9	2.5	2.5	2.6	2.6	2.5
22	3.0	3.1	4.9	4.8	4.8	3.5	2.9	2.5	2.5	2.6	2.6	2.5
23	3.0	3.1	5.1	4.9	5.1	3.5	2.8	2.5	2.5	2.6	2.6	2.5
24	3.0	3.1	4.9	5.3	5.0	3.4	2.8	2.5	2.5	2.6	2.6	2.5
25	3.0	3.1	4.9	5.7	4.5	3.3	2.8	2.5	2.6	2.6	2.6	2.5
26	3.0	3.0	4.8	5.3	4.5	3.3	2.8	2.5	2.6	2.6	2.6	2.5
27	3.1	3.0	4.6	5.0	4.4	3.3	2.8	2.5	2.6	2.6	2.6	2.5
28	3.2	3.0	4.6	4.8	4.4	3.2	2.8	2.5	2.5	2.6	2.6	2.5
29	3.5	.....	4.9	4.5	4.4	3.1	2.8	2.5	2.5	2.6	2.6	2.5
30	4.8	.....	5.2	4.5	4.4	3.1	2.8	2.5	2.5	2.6	2.6	2.5
31	4.6	.....	5.8	.....	4.6	.....	2.8	2.5	.....	2.6	.....	2.5

SACRAMENTO RIVER AT ANTLER, CAL.

Location.—At the highway bridge at Antler, 200 feet above the mouth of Gregory Creek, in the SE. ¼ sec. 13, T. 35 N., R. 5 W., and about 22 miles below the Castella station. Pit River, the principal tributary of the upper Sacramento, enters about 14 miles below Antler.

Records available.—November 19, 1910, to December 31, 1911. Station discontinued December 31, 1911.

Drainage area.—461 square miles.

Gage.—Vertical staff on downstream end of wooden pier at right end of highway bridge.

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Channel.—Gravel and small bowlders, which shift slightly at high stages, but the control appears to be permanent.

Discharge measurements.—Made from bridge at the gage.

Accuracy.—Results at low and medium stages are considered good. The rating curve is not well defined for high water.

Cooperation.—Gage-height record furnished by C. H. Hamilton.

Discharge measurements of Sacramento River at Antler, Cal., in 1911–12.

Date.	Hydrographer.	Gage height.	Discharge.
1911.		*Feet.*	*Sec.-ft.*
Apr. 13	G. T. Peekama	6.64	4,630
May 26	....do	4.71	2,080
Sept. 22	....do	2.00	246
22	....do	2.01	246
1912.			
Jan. 28	H. J. Tompkins	4.88	2,220

Daily gage height, in feet, of Sacramento River at Antler, Cal., for 1911.

[C. H. Hamilton, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.6	6.4	3.6	5.2	4.6	4.8	3.1	2.0	2.0	2.3	2.1	2.2
2	2.6	7.4	4.1	7.0	4.6	4.7	2.9	2.0	2.0	2.4	2.1	2.2
3	2.5	5.8	4.5	6.5	4.7	4.7	2.9	2.0	2.0	2.3	2.1	2.2
4	2.4	5.5	4.8	7.0	4.7	4.7	2.9	2.0	2.0	2.3	2.1	2.2
5	2.4	5.2	5.1	8.0	4.8	4.7	2.9	2.0	2.0	2.3	2.1	2.2
6	2.4	5.9	10.5	7.3	4.8	4.7	2.9	2.0	2.0	2.2	2.1	2.2
7	2.4	4.5	11.8	7.0	4.8	4.8	2.9	2.0	2.0	2.1	2.1	2.3
8	2.4	4.5	10.4	6.9	4.8	4.8	2.9	2.0	2.0	2.1	2.1	2.3
9	2.5	4.4	10.1	6.5	4.8	4.8	2.9	2.0	2.0	2.2	2.2	2.4
10	2.6	4.9	9.7	6.0	4.8	4.8	2.9	2.0	2.0	2.1	2.5	2.3
11	2.6	5.9	9.0	5.9	4.9	4.7	2.7	2.0	2.0	2.2	2.5	2.2
12	2.6	5.1	8.1	5.4	4.6	4.7	2.6	2.0	2.0	2.2	2.5	2.2
13	2.7	5.0	6.4	4.8	4.7	4.6	2.6	2.0	2.0	2.1	2.5	2.1
14	2.8	4.7	5.0	4.8	4.8	4.6	2.6	2.0	2.0	2.1	2.5	2.1
15	3.0	4.6	5.0	4.6	4.8	4.6	2.4	2.0	2.0	2.0	2.4	2.1
16	3.0	4.4	5.0	4.6	4.8	4.5	2.4	2.0	2.0	2.0	2.3	2.1
17	3.0	4.3	5.0	4.8	4.9	4.5	2.4	2.0	2.0	2.0	2.3	2.1
18	3.1	4.1	4.8	4.8	4.9	4.4	2.3	2.0	2.0	2.1	2.2	2.1
19	3.7	4.0	4.5	4.8	5.0	4.4	2.3	2.0	2.0	2.1	2.2	2.1
20	7.5	3.8	4.0	4.8	5.0	4.3	2.4	2.0	2.0	2.0	2.2	2.1
21	7.3	3.8	3.8	4.8	4.9	4.3	2.3	2.0	2.0	2.0	2.2	2.1
22	4.0	3.7	3.7	4.8	4.8	4.3	2.3	2.0	2.0	2.1	2.2	2.1
23	3.5	3.6	3.6	4.8	4.8	4.2	2.3	2.0	2.0	2.1	2.2	2.1
24	3.5	3.6	3.4	4.8	5.2	4.2	2.3	2.0	2.0	2.0	2.1	2.1
25	3.5	3.6	3.0	4.8	5.2	4.2	2.3	2.0	2.0	2.0	2.1	2.1
26	3.8	3.6	3.8	4.8	5.0	4.2	2.2	2.0	2.0	2.1	2.1	2.1
27	4.9	3.5	3.4	4.8	5.0	4.1	2.2	2.0	2.0	2.1	2.1	2.1
28	6.2	3.4	4.0	4.6	5.0	4.0	2.1	2.0	2.0	2.1	2.2	2.2
29	5.3	.....	4.0	4.6	4.9	3.8	2.1	2.0	2.0	2.1	2.2	2.2
30	9.2	.....	4.2	4.6	4.8	3.3	2.1	2.0	2.0	2.1	2.2	2.2
31	8.0	.....	4.7	.....	4.8	.....	2.0	2.0	.....	2.1	.....	2.1

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Daily discharge, in second-feet, of Sacramento River at Antler, Cal., for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1		710	11		1,940	21	330	445
2		900	12		2,040	22	405	405
3		4,740	13		1,940	23	710	330
4		3,000	14		1,120	24	1,990	365
5		1,280	15		970	25	1,120	445
6		970	16		970	26	650	445
7		770	17		650	27	365	445
8		1,120	18		650	28	405	445
9		1,940	19	300	650	29	650	405
10		1,940	20	285	540	30	770	405
						31		405

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	445	4,290	1,040	2,620	1,940	2,160	710	245	245	330	270	300
2	445	5,330	1,460	5,200	1,940	2,040	595	245	245	365	270	300
3	405	3,410	1,840	4,440	2,040	2,040	595	245	245	330	270	300
4	365	3,000	2,160	5,200	2,040	2,040	595	245	245	330	270	300
5	365	2,620	2,500	6,830	2,160	2,040	595	245	245	330	270	300
6	365	3,560	11,400	5,670	2,160	2,040	595	245	245	300	270	300
7	365	1,840	14,000	5,200	2,160	2,160	595	245	245	270	270	330
8	365	1,840	11,200	5,040	2,160	2,160	595	245	245	270	270	330
9	405	1,740	10,600	4,440	2,160	2,160	595	245	245	300	300	365
10	445	2,260	9,860	3,700	2,160	2,160	595	245	245	270	405	330
11	445	3,560	8,580	3,560	2,260	2,040	490	245	245	300	405	300
12	445	2,500	7,000	2,870	1,940	2,040	445	245	245	270	405	300
13	490	2,380	4,290	2,160	2,040	1,940	445	245	245	270	405	270
14	540	2,040	2,380	2,160	2,160	1,940	445	245	245	270	405	270
15	650	1,940	2,380	1,940	2,160	1,940	365	245	245	245	365	270
16	650	1,740	2,380	1,940	2,160	1,840	365	245	245	245	330	270
17	650	1,640	2,380	2,160	2,260	1,840	365	245	245	245	330	270
18	710	1,460	2,160	2,160	2,260	1,740	330	245	245	270	300	270
19	1,120	1,370	1,840	2,160	2,380	1,740	330	245	245	270	300	270
20	6,000	1,200	1,370	2,160	2,380	1,640	365	245	245	245	300	270
21	5,670	1,200	1,200	2,160	2,260	1,640	330	245	245	245	300	270
22	1,370	1,120	1,120	2,160	2,160	1,640	330	245	245	270	300	270
23	970	1,040	1,040	2,160	2,160	1,550	330	245	245	270	300	270
24	970	1,040	900	2,160	2,620	1,550	330	245	245	245	270	270
25	970	1,040	650	2,160	2,620	1,550	330	245	245	245	270	270
26	1,200	1,040	1,200	2,160	2,380	1,550	300	245	245	270	270	270
27	2,260	970	900	2,160	2,380	1,460	300	245	245	270	270	270
28	3,990	900	1,370	1,940	2,380	1,370	270	245	245	270	300	300
29	2,740	.....	1,370	1,940	2,260	1,200	270	245	245	270	300	300
30	8,940	.....	1,550	1,940	2,160	835	270	245	245	270	300	300
31	6,830	.....	2,040	.....	2,160	.....	245	245	.....	270	.....	270

NOTE.—Daily discharge, 1910–11, determined from a rating curve well defined below 6,000 second-feet.

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Monthly discharge of Sacramento River at Antler, Cal., for 1910–11.

[Drainage area, 461 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
November 19–30	1,990	285	665	1.44	0.64	15,800	A.
December	4,740	330	1,080	2.34	2.70	66,400	A.
1911.							
January	8,940	365	1,660	3.60	4.15	102,000	A.
February	5,830	900	2,090	4.53	4.72	116,000	A.
March	14,000	650	3,680	7.98	9.20	226,000	A.
April	6,830	1,940	3,080	6.68	7.45	183,000	A.
May	2,620	1,940	2,210	4.79	5.52	136,000	A.
June	2,160	835	1,800	3.90	4.35	107,000	A.
July	710	245	430	.933	1.08	26,400	A.
August	245	245	245	.531	.61	15,100	A.
September	245	245	245	.531	.59	14,600	A.
October	365	245	278	.603	.70	17,100	A.
November	405	270	310	.672	.75	18,400	A.
December	365	270	289	.627	.72	17,800	A.
The year	14,000	245	1,350	2.93	39.84	979,000	

SACRAMENTO RIVER NEAR RED BLUFF, CAL.

Location.—In lot 4, sec. 34, T. 28 N., R. 3 W., at the lower end of Iron Canyon, 4 miles above Red Bluff and about 3 miles below the proposed Iron Canyon dam site. Paines Creek enters about 3 miles above and Antelope Creek about 7 miles below the station.

Records available.—January 28, 1902, to December 31, 1911. The State engineer in 1879 and the commissioner of public works in 1893 and 1894 made measurements at this point. From April 30, 1895, to June 30, 1902, a gaging station was maintained at Jellys Ferry, 12 miles above Red Bluff.

Drainage area.—10,400 square miles, including Goose Lake drainage area of 1,090 square miles.

Gage.—Staff in three sections on the left bank. Several gages have been used at this station, but all observations have been reduced to the present datum.

Channel.—Coarse gravel and small bowlders, and is permanent.

Discharge measurements.—Made from a car and cable a short distance above the gage.

Diversions and storage.—No storage of any importance has been developed in the drainage area above this station. A small amount of water is diverted from some of the minor tributaries for irrigation. With this exception the record at this station gives the natural run-off from the basin.

Accuracy.—Results at this station are excellent.

Discharge measurements of Sacramento River near Red Bluff, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 9	H. D. McGlashan	12.40	55,500
Apr. 29	J. E. Stewart	[a] 5.22	17,100
Aug. 21	.....do	[b] 1.48	5,330

[a] Weather Bureau gage at Red Bluff read 6.15.
[b] Weather Bureau gage read 1.25 one hour after measurement.

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Daily gage height, in feet, of Sacramento River near Red Bluff, Cal., for 1911.

[Richard Groebe, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.92	11.40	3.38	7.90	5.00	4.35	2.30	1.65	1.40	1.50	1.55	1.55
2	1.90	12.70	3.75	8.32	5.00	4.32	2.30	1.65	1.40	1.50	1.55	1.55
3	1.88	11.42	4.42	8.12	5.12	4.28	2.30	1.65	1.40	1.50	1.50	1.55
4	1.82	9.00	6.60	8.00	5.42	4.12	2.28	1.60	1.40	1.50	1.50	1.55
5	1.80	8.32	12.10	9.95	5.68	4.05	2.22	1.60	1.40	1.55	1.50	1.52
6	1.80	8.42	12.92	11.65	5.95	3.98	2.20	1.60	1.42	1.50	1.50	1.80
7	1.80	7.32	22.68	9.85	5.35	4.00	2.18	1.60	1.45	1.50	1.50	1.80
8	1.80	6.48	15.35	8.90	5.15	3.92	2.12	1.58	1.40	1.50	1.50	1.65
9	1.80	5.92	12.00	8.30	5.00	3.88	2.10	1.55	1.40	1.68	1.55	1.65
10	1.95	5.50	9.85	8.70	4.82	3.70	2.05	1.55	1.40	1.68	1.60	1.60
11	2.08	10.75	8.62	8.20	4.72	3.68	2.05	1.55	1.40	1.60	1.65	1.60
12	2.68	7.85	8.05	7.45	4.72	3.60	2.00	1.55	1.40	1.60	1.58	1.60
13	2.38	10.90	7.52	7.00	4.68	3.60	2.00	1.52	1.40	1.55	1.55	1.55
14	2.75	7.62	7.30	6.50	4.60	3.58	2.00	1.50	1.40	1.52	1.55	1.55
15	3.55	6.25	7.05	6.08	4.48	3.52	1.95	1.50	1.40	1.52	1.62	1.55
16	2.95	5.32	7.02	5.78	4.38	3.42	1.92	1.50	1.40	1.50	1.78	1.55
17	2.48	4.98	7.02	5.58	4.58	3.25	1.90	1.50	1.40	1.50	1.72	1.68
18	2.50	4.65	6.92	5.52	6.28	3.12	1.90	1.50	1.40	1.50	1.65	1.58
19	2.40	4.45	6.95	5.48	5.62	3.08	1.95	1.50	1.40	1.50	1.60	1.55
20	12.5	4.22	7.02	5.35	5.08	3.00	1.92	1.48	1.40	1.50	1.60	1.55
21	5.75	4.08	7.32	5.28	4.90	2.88	1.88	1.45	1.40	1.50	1.60	1.55
22	4.55	3.88	7.80	5.40	4.88	2.80	1.85	1.45	1.40	1.50	1.60	1.50
23	3.78	3.78	7.95	5.40	5.00	2.72	1.82	1.45	1.40	1.50	1.55	1.50
24	5.28	3.72	8.25	5.58	4.95	2.70	1.80	1.45	1.45	1.50	1.55	1.50
25	5.15	3.62	8.20	5.85	4.70	2.62	1.80	1.45	1.48	1.50	1.55	1.50
26	5.65	3.50	8.15	5.98	4.45	2.52	1.80	1.45	1.52	1.58	1.55	1.50
27	5.70	3.42	7.85	5.85	4.25	2.48	1.75	1.42	1.52	1.50	1.55	1.58
28	13.20	3.35	7.45	5.45	4.20	2.40	1.75	1.40	1.50	1.50	1.55	1.70
29	10.48	.....	7.28	5.20	4.10	2.38	1.72	1.40	1.50	1.50	1.55	1.60
30	13.40	.....	7.40	5.10	4.10	2.32	1.70	1.40	1.50	1.50	1.55	1.60
31	14.25	.....	7.75	.....	4.15	.....	1.65	1.42	.....	1.55	.....	1.60

Daily discharge, in second-feet, of Sacramento River near Red Bluff, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	6,400	46,400	10,800	29,000	16,600	14,200	7,430	5,720	5,110	5,350	5,470	5,470
2	6,350	53,800	12,100	30,900	16,600	14,100	7,430	5,720	5,110	5,350	5,470	5,470
3	6,300	46,500	14,500	30,000	17,100	13,900	7,430	5,720	5,110	5,350	5,350	5,470
4	6,140	34,100	23,200	29,400	18,200	13,400	7,370	5,590	5,110	5,350	5,350	5,470
5	6,090	30,900	50,300	38,800	19,300	13,100	7,210	5,590	5,110	5,470	5,350	5,400
6	6,090	31,400	55,100	47,800	20,400	12,900	7,150	5,590	5,160	5,350	5,350	6,090
7	6,090	26,300	130,000	38,300	18,000	12,900	7,100	5,590	5,230	5,350	5,350	6,090
8	6,090	22,600	70,600	33,600	17,200	12,700	6,930	5,540	5,110	5,350	5,350	5,720
9	6,090	20,300	49,700	30,800	16,600	12,500	6,880	5,470	5,110	5,790	5,470	5,720
10	6,480	18,600	38,300	32,700	15,900	11,900	6,740	5,470	5,110	5,790	5,590	5,590
11	6,830	42,900	32,300	30,300	15,600	11,800	6,740	5,470	5,110	5,590	5,720	5,590
12	8,540	28,700	29,600	26,900	15,600	11,500	6,610	5,470	5,110	5,590	5,540	5,590
13	7,650	43,700	27,200	24,900	15,400	11,500	6,610	5,400	5,110	5,470	5,470	5,470
14	8,760	27,700	26,200	22,700	15,100	11,500	6,610	5,350	5,110	5,400	5,470	5,470
15	11,400	21,600	25,100	20,900	14,700	11,300	6,480	5,350	5,110	5,400	5,640	5,470
16	9,380	17,900	25,000	19,700	14,300	10,900	6,400	5,350	5,110	5,350	6,040	5,470
17	7,940	16,500	25,000	18,900	15,000	10,400	6,350	5,350	5,110	5,350	5,890	5,790
18	8,000	15,300	24,500	18,600	21,800	9,930	6,350	5,350	5,110	5,350	5,720	5,540
19	7,710	14,600	24,700	18,500	19,000	9,800	6,480	5,350	5,110	5,350	5,590	5,470
20	52,600	13,700	25,000	18,000	16,900	9,540	6,400	5,300	5,110	5,350	5,590	5,470
21	19,600	13,200	26,300	17,700	16,200	9,160	6,300	5,230	5,110	5,350	5,590	5,470
22	14,900	12,500	28,500	18,200	16,200	8,910	6,220	5,230	5,110	5,350	5,590	5,350
23	12,200	12,200	29,200	18,200	16,600	8,660	6,140	5,230	5,110	5,350	5,470	5,350
24	17,700	12,000	30,600	18,900	16,400	8,600	6,090	5,230	5,230	5,350	5,470	5,350
25	17,200	11,600	30,300	20,000	15,500	8,360	6,090	5,230	5,300	5,350	5,470	5,350
26	19,200	11,200	30,100	20,500	14,600	8,060	6,090	5,230	5,400	5,540	5,470	5,350
27	19,400	10,900	28,700	20,000	13,800	7,940	5,960	5,160	5,400	5,350	5,470	5,540
28	56,800	10,700	26,900	18,400	13,700	7,710	5,960	5,110	5,350	5,350	5,470	5,840
29	41,500	.....	26,200	17,400	13,300	7,650	5,890	5,110	5,350	5,350	5,470	5,590
30	58,000	.....	26,700	17,000	13,200	7,500	5,840	5,110	5,350	5,350	5,470	5,590
31	63,300	.....	28,300	.....	13,500	.....	5,720	5,160	.....	5,470	.....	5,590

NOTE.—Daily discharge determined from a well-defined rating curve.

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Monthly discharge of Sacramento River near Red Bluff, Cal., for 1911.

[Drainage area, 10,400 a square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	63,300	6,090	17,100	1.64	1.89	1,050,000	A.
February	53,800	10,700	23,800	2.29	2.38	1,320,000	A.
March	130,000	10,800	33,300	3.20	3.69	2,050,000	A.
April	47,800	17,000	24,900	2.39	2.67	1,480,000	A.
May	21,800	13,300	16,200	1.56	1.80	996,000	A.
June	14,200	7,500	10,700	1.03	1.15	637,000	A.
July	7,430	5,720	6,550	.630	.73	403,000	A.
August	5,720	5,110	5,380	.517	.60	331,000	A.
September	5,400	5,110	5,170	.497	.55	308,000	A.
October	5,790	5,350	5,410	.520	.60	333,000	A.
November	6,040	5,350	5,520	.531	.59	328,000	A.
December	6,090	5,350	5,550	.534	.62	341,000	A.
The year	130,000	5,110	13,200	1.27	17.27	9,580,000	

a Drainage area changed from 9,300 square miles to 10,400 square miles to include Goose Lake basin, which is naturally a part of the Sacramento River basin.

PIT RIVER AND TRIBUTARIES.

PIT RIVER AT HENDERSON, CAL.

Location.—At Henderson Ferry, one-fourth mile above Henderson post office, in sec. 36, T. 37 N., R. 1 W. Nelson Creek enters half a mile above and Kosk Creek 1 mile below the station.

Records available.—September 28, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on an alder tree on left bank about 100 feet above the ferry.

Channel.—Small bowlders and coarse gravel and is fairly permanent.

Discharge measurements.—Made from car and cable 80 feet below gage.

Accuracy.—Sufficient discharge measurements have not been made to define the rating curve at medium and high stages.

The gage readings are not entirely satisfactory and are withheld pending the development of the rating curve when comparisons with the discharge at Ydalpom will aid in their proper interpretation.

Discharge measurements of Pit River at Henderson, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 9	G. T. Peekema	2.20	5,350
Aug. 12	J. E. Stewart	.98	3,110

PIT RIVER NEAR YDALPOM, CAL.

Location.—At Silverthorne Ferry, in the NW. ¼ sec. 32, T. 34 N., R. 3 W., 1½ miles southwest of Ydalpom and 7½ miles above junction with Sacramento River. Squaw Creek enters one-half mile above and McCloud River 4 miles below the station.

Records available.—November 16, 1910, to December 31, 1911

Drainage area.—6,350 square miles.

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Gage.—Vertical staff on an ash tree on left bank 350 feet below ferry.

Channel.—Gravel and sand and appears permanent.

Discharge measurements.—On October 1, 1911, a car and cable were installed 50 feet above the ferry cable. Before this date gagings were made from a boat at this section.

Diversion.—Water is diverted above the station for irrigation from the main stream and from the tributaries.

Accuracy.—Results are good.

Discharge measurements of Pit River near Ydalpom, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 2[a]	G. T. Peekema	8.43	18,400
May 24[b]	....do	4.92	6,040
Oct. 3[c]	....do	3.00	3,110

[a] Measurement made from boat 30 feet below ferry cable; measurement very poor.
[b] Measurement made from boat 30 feet below ferry cable.
[c] Measurement made from cable.

Daily gage height, in feet, of Pit River near Ydalpom, Cal., for 1911.

[M. D. Rodrigue, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.3	7.6	4.0	8.3	5.3	4.4	3.4	3.15	3.0	3.0	3.05	3.1
2	3.3	9.8	4.0	8.3	5.3	4.4	3.4	3.15	3.0	3.0	3.05	3.1
3	3.25	8.5	4.05	8.4	5.6	4.35	3.4	3.15	3.0	3.0	3.05	3.1
4	3.25	7.6	4.2	8.25	5.45	4.35	3.4	3.1	3.0	3.05	3.05	3.1
5	3.25	7.6	4.95	8.1	5.7	4.35	3.4	3.1	3.0	3.05	3.1	3.1
6	3.25	7.7	6.65	10.1	5.5	4.3	3.4	3.1	3.0	3.05	3.1	3.1
7	3.25	6.95	10.8	10.05	5.4	4.3	3.4	3.1	3.0	3.05	3.1	3.1
8	3.25	6.65	9.9	9.2	5.25	4.2	3.4	3.1	3.0	3.05	3.1	3.1
9	3.25	6.5	8.0	8.1	5.2	4.2	3.4	3.1	3.0	3.05	3.1	3.1
10	3.3	6.45	7.7	8.0	5.2	4.1	3.4	3.1	3.0	3.05	3.2	3.1
11	3.4	6.55	7.45	7.8	5.1	4.0	3.35	3.1	3.0	3.05	3.2	3.1
12	3.45	6.9	7.45	7.55	5.0	3.95	3.35	3.1	3.0	3.05	3.2	3.1
13	3.4	6.9	7.55	7.2	4.95	4.0	3.35	3.05	3.0	3.05	3.2	3.1
14	3.5	6.2	7.75	6.8	4.8	3.95	3.35	3.05	3.0	3.1	3.25	3.1
15	3.7	5.75	7.5	6.6	4.75	3.95	3.35	3.05	3.0	3.1	3.25	3.1
6	3.55	5.1	7.5	6.1	4.85	3.9	3.35	3.0	3.0	3.1	3.25	3.1
17	3.45	4.85	7.5	6.0	4.85	3.9	3.3	3.0	3.0	3.1	3.2	3.1
18	3.4	4.8	7.65	5.9	7.15	3.8	3.3	3.0	3.0	3.1	3.2	3.1
19	4.7	4.7	7.8	5.7	5.6	3.75	3.3	3.0	3.0	3.1	3.2	3.1
20	6.5	4.55	7.9	5.6	5.4	3.7	3.3	3.0	3.0	3.1	3.2	3.1
21	4.7	4.4	8.0	5.5	5.2	3.7	3.3	3.0	3.0	3.1	3.2	3.1
22	4.2	4.4	8.6	5.55	5.1	3.7	3.3	3.0	3.0	3.1	3.2	3.1
23	3.85	4.35	8.8	5.6	5.0	3.65	3.3	3.0	3.0	3.1	3.2	3.1
24	3.95	4.3	9.0	5.6	4.9	3.65	3.25	3.0	3.0	3.05	3.2	3.1
25	4.2	4.3	9.4	5.7	4.8	3.6	3.25	3.0	3.0	3.05	3.2	3.1
26	4.55	4.2	9.2	5.7	4.7	3.55	3.25	3.0	3.0	3.05	3.2	3.1
27	5.3	4.1	8.9	5.7	4.6	3.4	3.25	3.0	3.0	3.05	3.1	3.1
28	7.2	4.0	8.5	5.5	4.45	3.5	3.2	3.0	3.0	3.05	3.1	3.1
29	6.15	.....	8.2	5.4	4.4	3.45	3.2	3.0	3.0	3.05	3.1	3.1
30	8.95	.....	8.25	5.35	4.5	3.4	3.2	3.0	3.0	3.05	3.1	3.1
31	8.95	.....	8.3	.....	4.45	.....	3.15	3.0	.....	3.05	.....	3.1

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Daily discharge, in second-feet, of Pit River near Ydalpom, Cal., for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1		3,980	11		8,960	21	3,220	4,140
2		4,220	12		8,120	22	3,150	4,060
3		5,470	13		7,620	23	3,520	3,980
4		5,380	14		7,420	24	4,300	3,900
5		4,790	15		6,740	25	4,960	3,820
6		4,380	16	3,120	6,000	26	4,060	3,740
7		4,140	17	3,120	5,470	27	3,980	3,670
8		4,220	18	3,330	5,040	28	4,220	3,600
9		7,120	19	3,220	4,620	29	4,140	3,520
10		8,120	20	3,220	4,380	30	4,060	3,520
						31		3,520

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	3,520	11,900	4,620	13,700	6,930	5,300	3,670	3,300	3,080	3,080	3,150	3,220
2	3,520	17,700	4,620	13,700	6,930	5,300	3,670	3,300	3,080	3,080	3,150	3,220
3	3,440	14,200	4,700	13,900	7,520	5,220	3,670	3,300	3,080	3,080	3,150	3,220
4	3,440	11,900	4,960	13,600	7,220	5,220	3,670	3,220	3,080	3,150	3,150	3,220
5	3,440	11,900	6,270	13,200	7,720	5,220	3,670	3,220	3,080	3,150	3,220	3,220
6	3,440	12,200	9,720	18,600	7,320	5,130	3,670	3,220	3,080	3,150	3,220	3,220
7	3,440	10,400	20,600	18,400	7,120	5,130	3,670	3,220	3,080	3,150	3,220	3,220
8	3,440	9,720	18,000	16,100	6,840	4,960	3,670	3,220	3,080	3,150	3,220	3,220
9	3,440	9,390	12,900	13,200	6,740	4,960	3,670	3,220	3,080	3,150	3,220	3,220
10	3,520	9,280	12,200	12,900	6,740	4,790	3,670	3,220	3,080	3,150	3,370	3,220
11	3,670	9,500	11,600	12,400	6,550	4,620	3,600	3,220	3,080	3,150	3,370	3,220
12	3,740	10,300	11,600	11,800	6,360	4,540	3,600	3,220	3,080	3,150	3,370	3,220
13	3,670	10,300	11,800	11,000	6,270	4,620	3,600	3,150	3,080	3,150	3,370	3,220
14	3,820	8,750	12,300	10,100	6,000	4,540	3,600	3,150	3,080	3,220	3,440	3,220
15	4,140	7,820	11,700	9,610	5,910	4,540	3,600	3,150	3,080	3,220	3,440	3,220
16	3,900	6,550	11,700	8,540	6,090	4,460	3,600	3,080	3,080	3,220	3,440	3,220
17	3,740	6,090	11,700	8,330	6,090	4,460	3,520	3,080	3,080	3,220	3,370	3,220
18	3,670	6,000	12,100	8,120	10,900	4,300	3,520	3,080	3,080	3,220	3,370	3,220
19	5,820	5,820	12,400	7,720	7,520	4,220	3,520	3,080	3,080	3,220	3,370	3,220
20	9,390	5,560	12,700	7,520	7,120	4,140	3,520	3,080	3,080	3,220	3,370	3,220
21	5,820	5,300	12,900	7,320	6,740	4,140	3,520	3,080	3,080	3,220	3,370	3,220
22	4,960	5,300	14,500	7,420	6,550	4,140	3,520	3,080	3,080	3,220	3,370	3,220
23	4,380	5,220	15,000	7,520	6,360	4,060	3,520	3,080	3,080	3,220	3,370	3,220
24	4,540	5,130	15,500	7,520	6,180	4,060	3,440	3,080	3,080	3,150	3,370	3,220
25	4,960	5,130	16,600	7,720	6,000	3,980	3,440	3,080	3,080	3,150	3,370	3,220
26	5,560	4,960	16,100	7,720	5,820	3,900	3,440	3,080	3,080	3,150	3,370	3,220
27	6,930	4,790	15,300	7,720	5,640	3,670	3,440	3,080	3,080	3,150	3,220	3,220
28	11,000	4,620	14,200	7,320	5,380	3,820	3,370	3,080	3,080	3,150	3,220	3,220
29	8,640	.....	13,400	7,120	5,300	3,740	3,370	3,080	3,080	3,150	3,220	3,220
30	15,400	.....	13,600	7,020	5,470	3,670	3,370	3,080	3,080	3,150	3,220	3,220
31	15,400	.....	13,700	.....	5,380	.....	3,300	3,080	.....	3,150	.....	3,220

NOTE.—Daily discharge 1910–11 determined from a well-defined rating curve.

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Monthly discharge of Pit River near Ydalpom, Cal., for 1910–11.

[Drainage area, 6,350[a] square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
November 16–30	4,960	3,120	3,710	0.584	0.33	110,000	A.
December	8,960	3,520	5,090	.802	.92	313,000	A.
1911.							
January	15,400	3,440	5,410	.852	.98	333,000	A.
February	17,700	4,620	8,420	1.33	1.38	468,000	A.
March	20,600	4,620	12,200	1.92	2.21	750,000	A.
April	18,600	7,020	10,600	1.67	1.86	631,000	A.
May	10,900	5,300	6,600	1.04	1.20	406,000	A.
June	5,300	3,670	4,500	.709	.79	268,000	A.
July	3,670	3,300	3,550	.559	.64	218,000	A.
August	3,300	3,080	3,150	.496	.57	194,000	A.
September	3,080	3,080	3,080	.485	.54	183,000	A.
October	3,220	3,080	3,170	.499	.58	195,000	A.
November	3,440	3,150	3,300	.520	.58	196,000	A.
December	3,220	3,220	3,220	.507	.58	198,000	A.
The year	20,600	3,080	5,580	.879	11.91	4,040,000	

[a] Includes Goose Lake drainage basin—1,090 square miles.

COTTONWOOD CREEK NEAR LAKEVIEW, OREG.

Location.—In sec. 29, T. 38 S., R. 19 E., about 10 miles west of Lakeview and about half a mile below the site of the Oregon Valley Land Co.'s proposed dam.

Records available.—November 22, 1908, to December 31, 1911.

Drainage area.—30 square miles.

Gage.—An inclined staff on the left bank about 25 feet above the footbridge. On November 22, 1908, a 10-foot trapezoidal weir was installed and a gage placed above it as an index to head. On January 19, 1909, the length of the weir was increased to 15 feet, a footbridge was installed about 1,000 feet below it, and an inclined gage (that now in use) was set on the left bank.

Channel.—Clean gravel; probably permanent; one at all stages; both banks low and wooded and may be overflowed at flood stages.

Winter flow.—Affected by ice for short periods during extremely cold weather.

Discharge measurements.—Made from the footbridge about one-fourth mile below a former camp and half a mile below the weir.

Accuracy.—The creek is subject to large diurnal fluctuations during the spring, and as the gage has been read only once or twice daily the determinations of flow are subject to considerable error.

Cooperation.—Station maintained in cooperation with the Lakeview Irrigation & Power Co.

The following discharge measurement was made by R. W. Davenport:
May 4, 1911: Gage height, 1.58 feet; discharge, 95 second-feet.

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Daily gage height, in feet, of Cottonwood Creek near Lakeview, Oreg., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0.45	1.25	0.48	2.6	1.65	1.60	0.72	0.42	0.20	0.28	0.20	0.38
2	.50	.80	.52	2.45	2.05	1.90	.72	.42	.18	.25	.20	.35
3	.48	.70	.88	2.45	1.60	1.80	.70	.40	.18	.25	.18	.32
4	.40	.58	1.20	2.45	1.85	1.95	.70	.40	.20	.28	.15	.32
5	.38	.40	.90	2.5	1.95	1.70	.70	.40	.22	.30	.18	.30
6	.35	.48	.80	2.6	1.90	1.80	.70	.42	.22	.28	.20	.35
7	.35	.90	.62	2.5	1.90	2.10	.68	.40	.25	.25	.22	.38
8	.35	1.25	.52	2.25	1.85	1.85	.65	.38	.22	.25	.25	.35
9	.32	1.15	.52	2.20	1.90	2.00	.65	.38	.22	.28	.25	.35
10	.32	1.20	.55	1.85	1.90	1.90	.65	.38	.20	.25	.28	.32
11	.30	1.20	.50	1.60	1.85	1.75	.62	.38	.20	.22	.28	.35
12	.30	1.10	.48	1.55	1.75	1.70	.62	.38	.18	.18	.25	.30
13	.32	1.10	.52	1.50	1.65	1.70	.60	.35	.18	.15	.22	.30
14	.28	1.00	.52	1.60	1.70	1.60	.58	.35	.18	.25	.30	.32
15	.38	1.20	.50	1.50	1.70	1.65	.58	.32	.15	.22	.45	.42
16	.32	1.15	.52	1.55	1.80	1.60	.58	.30	.15	.22	.55	.40
17	.30	1.10	.72	1.45	1.70	1.50	.55	.30	.18	.22	.55	.40
18	.32	1.20	.95	1.55	1.75	1.45	.55	.28	.15	.22	.50	.38
19	.38	1.25	1.20	1.25	1.75	1.40	.55	.25	.12	.20	.52	.32
20	.30	.80	1.50	1.25	1.70	1.20	.52	.28	.15	.20	.55	.40
21	.28	.65	1.80	1.30	1.42	1.50	.52	.28	.12	.18	.55	.45
22	.28	.62	2.5	1.40	1.70	1.25	.50	.25	.12	.22	.52	.50
23	.28	.60	2.6	2.05	1.45	1.00	.50	.28	.15	.25	.52	.45
24	.42	.68	2.45	2.10	1.50	1.00	.50	.25	.15	.22	.50	.60
25	.32	.60	2.6	2.00	1.60	.98	.48	.22	.18	.20	.50	.90
26	.30	.58	2.35	2.05	1.50	.92	.48	.22	.35	.20	.48	.88
27	.42	.52	2.20	2.40	1.45	.85	.48	.22	.30	.22	.42	.58
28	.48	.50	2.35	2.45	1.50	.78	.45	.20	.25	.25	.42	.35
29	.48	.....	2.00	2.00	1.45	.70	.45	.25	.25	.22	.40	.30
30	.52	.....	2.6	1.80	1.50	.75	.42	.25	.28	.20	.40	.25
31	.95	.....	2.6	.....	1.50	.....	.42	.22	.....	.18	.....	.22

NOTE.—Ice probably existed at this station from about Jan. 1 to Mar. 10 and Dec. 20 to 31; effect on the relation of gage height to discharge was not great during January but was considerable during February, March, and December. Corrections have been applied to many of the gage readings from Mar. 17 to May 17 to allow for diurnal fluctuation of stage.

Daily discharge, in second-feet, of Cottonwood Creek near Lakeview, Oreg., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	.....	.....	210	99	94	25	10	3	5	3	8
2	13	.....	.....	190	140	124	25	10	3	4	3	8
3	12	.....	.....	190	94	114	24	9	3	4	3	7
4	9	.....	.....	190	119	130	24	9	3	5	2	7
5	8	.....	.....	196	130	104	24	9	4	6	3	6
6	8	.....	.....	210	124	114	24	10	4	5	3	8
7	8	.....	.....	196	124	146	23	9	4	4	4	8
8	8	.....	.....	164	119	119	21	8	4	4	4	8
9	7	.....	.....	158	124	135	21	8	4	5	4	8
10	7	.....	.....	119	124	124	21	8	3	4	5	7
11	6	.....	13	94	119	109	19	8	3	4	5	8
12	6	.....	12	89	109	104	19	8	3	3	4	6
13	7	.....	14	84	99	104	18	8	3	2	4	6
14	5	.....	14	94	104	94	17	8	3	4	6	7
15	8	.....	13	84	104	99	17	7	2	4	11	10
16	7	.....	14	89	114	94	17	6	2	4	16	9
17	6	.....	25	80	104	84	16	6	3	4	16	9
18	7	.....	40	89	109	80	16	5	2	4	13	8
19	8	.....	58	62	109	75	16	4	2	3	14	7
20	6	.....	84	62	104	58	14	5	2	3	16	.....
21	5	.....	114	66	77	84	14	5	2	3	16	.....
22	5	.....	196	75	104	62	13	4	2	4	14	.....
23	5	.....	210	140	80	43	13	5	2	4	14	.....
24	10	.....	190	146	84	43	13	4	2	4	13	.....
25	7	.....	210	135	94	42	12	4	3	3	13	.....

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Daily discharge, in second-feet, of Cottonwood Creek near Lakeview, Oreg., for 1911—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26	6	.....	176	140	84	37	12	4	8	3	12	.....
27	10	.....	158	183	80	33	12	4	6	4	10	.....
28	12	.....	176	190	84	29	11	3	4	4	10	.....
29	12	.....	135	135	80	24	11	4	4	4	9	.....
30	14	.....	210	114	84	27	10	4	5	3	9	.....
31	10	.....	210	.....	84	.....	10	4	.....	3	.....	.....

NOTE.—Daily discharge determined from a rating curve fairly well defined below 150 second-feet; no reduction on account of ice Jan. 1 to 30; discharge Jan. 31 estimated because of ice.

Monthly discharge of Cottonwood Creek near Lakeview, Oreg., for 1911.

[Drainage area, 30 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	14	5	8.2	0.273	0.31	504	D.
February	.....	.....	a5.0	.167	.17	278	D.
March	210	.....	76.0	2.53	2.92	4,670	C.
April	210	62	132	4.40	4.91	7,860	C.
May	140	77	103	3.43	3.95	6,330	C.
June	146	24	84.3	2.81	3.14	5,020	C.
July	25	10	17.2	.573	.66	1,060	B.
August	10	3	6.5	.217	.25	400	B.
September	8	2	3.3	.110	.12	196	B.
October	6	2	3.9	.130	.15	240	B.
November	16	2	8.6	.287	.32	512	B.
December	10	.....	6.2	.207	.24	381	B.
The year	210	2	38.0	1.27	17.14	27,500	

a Estimated.

NOTE.—Discharge Jan. 31 to Mar. 10 and Dec. 20 to 31 corrected for effect of ice; mean discharge Mar. 1 to 10 estimated at about 8 second-feet; mean discharge Dec. 20 to 31 estimated at about 5 second-feet. The accuracy rating of the records, during the spring high water, at this station is lowered by the diurnal fluctuations in stage.

DREWS CREEK NEAR LAKEVIEW, OREG.

Location.—At a wagon bridge in sec. 4, T. 40 S., R. 18 E., 1 mile below Drews Creek Dam and 22 miles southwest of Lakeview.

Records available.—January 16, 1909, to December 31, 1911.

Drainage area.—211 square miles.

Gages.—At station No. 1, an inclined staff at the dam site, established January 16, 1909. Gage at station No. 2—at a dump car bridge 100 feet below the dam site—read from November 20, 1909, to March 1, 1910. Gage at present site, station No. 3, a staff established March 1, 1910. A Barrett-Lawrence automatic gage was installed December 13, 1911.

Channel.—Gravel; not likely to shift at high stages; creek overflows into a second channel; bed usually dry two or three months each year.

Discharge measurements.—Made from wagon bridge near gage or by wading.

Winter flow.—Affected by ice. Effect was not same in 1911 and was not taken into consideration in the estimates of discharge.

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Accuracy.—The gage readings—two daily—indicate that the diurnal fluctuation is not marked except at extreme high water. Allowance has been made for the effect of ice during the winter months so that the accuracy of the estimate of total run-off is not affected.

Cooperation.—Observations made and records furnished by the Lakeview Irrigation & Power Co.

Discharge measurements of Drews Creek near Lakeview, Oreg., for 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Feb. 10	H. W. Fraim	.....	12.3
Mar. 20	....do	3.94	346
24	B. H. Page	5.90	1,060
May 5	R. W. Davenport	3.69	266
11	H. W. Fraim	3.30	190
Aug. 23	R. W. Davenport	1.54	[a]0.05
Dec. 14[b]	W. O. Harmon	1.79	1.4

[a] Estimated. [b] Measured by wading.

Daily gage height, in feet, of Drews Creek near Lakeview, Oreg., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.0	.....	6.4	3.8	3.0	2.0	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	.....	2.0	.....	.....	.....	.....	.....
3	.....	2.3	.....	6.05	.....	3.0	2.0	.....	.....	.....	.....	.....
4	.....	.....	.....	5.7	.....	2.9	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	5.8	3.9	.....	1.9	.....	.....	.....	.....	.....
6	.....	.....	1.8	.....	.....	3.0	1.9	.....	.....	.....	.....	.....
7	.....	.....	.....	4.9	3.7	.....	1.9	.....	.....	.....	.....	.....
8	.....	.....	.....	4.9	.....	3.1	1.9	.....	.....	.....	.....	.....
9	.....	1.8	1.8	5.15	3.5	.....	.....	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	3.3	2.7	1.8	.....	.....	.....	.....	.....
11	1.8	.....	.....	4.0	3.3	2.7	1.8	.....	.....	.....	.....	.....
12	1.9	1.7	2.15	3.9	.....	2.9	1.8	.....	.....	.....	.....	.....
13	1.9	.....	.....	3.8	3.35	2.6	1.8	.....	.....	.....	.....	1.79
14	1.9	.....	.....	3.75	.....	2.7	1.7	.....	.....	.....	.....	1.79
15	1.9	.....	.....	3.7	3.4	2.6	1.7	.....	.....	.....	.....	1.77
16	1.85	.....	.....	.....	.....	2.6	1.7	.....	.....	.....	.....	1.76
17	1.9	.....	.....	4.2	3.3	2.6	1.8	.....	.....	.....	.....	1.76
18	1.9	.....	.....	.....	.....	2.5	1.8	.....	.....	.....	.....	1.75
19	1.9	.....	.....	4.1	3.3	2.5	1.8	.....	.....	.....	.....	1.75
20	1.85	1.7	3.95	.....	3.2	2.5	1.7	.....	.....	.....	.....	1.75
21	1.9	.....	4.5	4.05	3.0	2.4	1.7	.....	.....	.....	.....	1.75
22	1.9	.....	5.2	.....	2.9	2.4	1.6	.....	.....	.....	.....	1.75
23	1.9	.....	6.4	4.2	.....	2.3	1.6	.....	.....	.....	.....	1.75
24	1.9	.....	6.0	.....	.....	2.3	1.5	.....	.....	.....	.....	1.75
25	1.85	.....	5.6	4.4	.....	2.2	1.5	.....	.....	.....	.....	1.75
26	1.8	.....	5.7	4.15	.....	2.2	1.5	.....	.....	.....	.....	1.75
27	1.8	1.6	4.8	4.2	.....	2.1	1.5	.....	.....	.....	.....	1.75
28	1.8	.....	6.0	4.0	.....	2.1	1.5	.....	.....	.....	.....	1.75
29	1.8	.....	6.0	.....	.....	2.0	1.5	.....	.....	.....	.....	1.75
30	1.85	.....	5.85	3.9	.....	.....	1.5	.....	.....	.....	.....	1.74
31	1.9	.....	6.2	.....	.....	.....	1.5	.....	.....	.....	.....	1.74

NOTE.—Relation of gage height to discharge more or less affected by ice from Jan. 1 to Mar. 19. Channel dry from about July 24 to first part of November.

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Daily discharge, in second-feet, of Drews Creek near Lakeview, Oreg., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8	12	3	1,300	314	124	12					
2	8	22	4	1,210	321	124	12					
3	8	32	4	1,120	328	124	12					
4	8	20	4	970	335	106	10					
5	8	16	5	1,010	342	115	8					
6	6	12	5	834	314	124	8					
7	6	9	5	656	286	134	8					
8	6	7	5	656	260	144	8					
9	6	5	5	750	234	110	6					
10	6	12	10	560	188	75	5					
11	5	8	15	370	188	75	5					
12	8	3	20	342	194	106	5					
13	8	3	30	314	199	62	5					1.4
14	8	3	40	300	204	75	3					1.4
15	8	3	60	286	210	62	3					1.2
16	6	3	90	358	199	62	3					1.1
17	8	3	120	430	188	62	5					1.1
18	8	3	150	415	188	51	5					1.0
19	8	3	250	400	188	51	5					1.0
20	6	3	356	392	166	51	3					1.0
21	8	3	526	385	124	41	3					1.0
22	8	3	770	408	106	41	1					1.0
23	8	3	1,300	430	100	32	1					1.0
24	8	3	1,100	462	100	32	0					1.0
25	6	2	930	494	100	24	0					1.0
26	5	2	970	415	100	24	0					1.0
27	5	2	622	430	100	17	0					1.0
28	5	3	1,100	370	100	17	0					1.0
29	5	.....	1,100	356	100	12	0					1.0
30	6	.....	1,030	342	100	12	0					.9
31	8	.....	1,200	.....	100	.....	0					.9

NOTE.—Daily discharge January to July determined from a well-defined rating curve. Discharge Dec. 13 to 31 estimated from measurement Dec. 14. Daily discharge for days on which gage was not read interpolated or roughly estimated from the record of discharge of Cottonwood Creek. No correction for effect of ice.

Monthly discharge of Drews Creek near Lakeview, Oreg., for 1911.

[Drainage area, 211 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	8	5	6.9	0.033	0.04	424	D.
February	32	2	7.2	.034	.04	400	D.
March	1,300	3	382	1.81	2.09	23,500	B.
April	1,300	286	559	2.65	2.96	33,300	B.
May	342	100	193	.915	1.05	11,900	B.
June	144	12	69.6	.330	.37	4,140	B.
July	12	0	4.4	.022	.03	271	B.
August	0	0	0	.000	0	0	
September	0	0	0	.000	0	0	
October	0	0	0	.000	0	0	
November [a]	.....	.....	1.0	.005	.01	59.5	C.
December [a]	.....	.....	1.0	.005	.01	61.4	B.
The year	1,300	0	102	.483	6.60	74,200	

[a] Estimated.

NOTE.—Accuracy rating lowered by diurnal fluctuations in stage. Daily discharge Nov. 1 to Dec. 12 estimated at 1 second-foot.

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HAT CREEK AT HAWKINS RANCH, NEAR HAT CREEK, CAL.

Location.—At Hawkins ranch, in sec. 5, T. 33 N., R. 5 E., 6 miles above Hat Creek.
Records available.—August 15 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff on upstream end of right abutment.
Channel.—Fairly smooth and probably permanent.
Discharge measurements.—Made from downstream side of footbridge.
Diversions.—The only diversion for irrigation of any importance above this station is the H. M. Wilcox ditch, which heads about one-half mile above the gage. About 40 second-feet is diverted by this canal at irregular intervals, as shown by the observer's notes.

The following discharge measurement was made by J. E. Stewart:
August 15, 1911: Gage height, 2.35 feet; discharge, 134 second-feet.

Daily gage height, in feet, of Hat Creek at Hawkins ranch, near Hat Creek, Cal., for 1911.

[Chas. Hawkins, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.60	2.55	2.70	2.70	17	2.50	2.42	2.65	2.70	2.60
2	.....	2.60	2.52	2.70	2.70	18	4.50	2.42	2.65	2.70	2.60
3	.....	2.60	2.58	2.70	2.70	19	2.52	2.50	2.68	2.70	2.60
4	.....	2.60	2.70	2.70	2.70	20	2.52	2.50	2.70	2.70	2.60
5	.....	2.58	2.70	2.70	2.70	21	2.52	2.42	2.70	2.70	2.60
6	.....	2.60	2.72	2.70	2.70	22	2.50	2.42	2.70	2.70	2.60
7	.....	2.62	2.75	2.70	2.65	23	2.35	2.60	2.70	2.70	2.60
8	.....	2.65	2.70	2.70	2.65	24	2.35	2.65	2.70	2.70	2.60
9	.....	2.60	2.70	2.70	2.65	25	2.35	2.65	2.70	2.70	2.60
10	.....	2.60	2.65	2.70	2.65	26	2.33	2.70	2.70	2.70	2.60
11	.....	2.62	2.65	2.70	2.65	27	2.30	2.70	2.70	2.70	2.60
12	.....	2.50	2.65	2.70	2.65	28	2.30	2.65	2.70	2.70	2.60
13	.....	2.52	2.65	2.70	2.62	29	2.30	2.60	2.70	2.70	2.60
14	.....	2.50	2.68	2.70	2.62	30	2.35	2.60	2.70	2.70	2.62
15	2.35	2.50	2.68	2.70	2.60	31	2.50	.....	2.70	.....	2.62
16	2.35	2.42	2.65	2.70	2.60						

NOTE.—Rise in gage height Aug. 17, Sept. 1, and Sept. 23 caused by turning in of irrigation ditch above the station; fall in gage heights Aug. 23 and Sept. 12 caused by turning out of irrigation ditch above station.

HAT CREEK AT HAT CREEK, CAL.

Location.—At the private highway bridge, or Morris ranch, in the Lassen National Forest, in the SE. ¼ sec. 10, T. 34 N., R. 4 E., M. D. M., 300 yards north of Hat Creek post office.
Records available.—September 22, 1910, to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to downstream end of right abutment of bridge.
Channel.—Gravel and small bowlders, and appears permanent.
Discharge measurements.—Made from downstream side of bridge.
Diversions.—On account of the diversions for irrigation above the station this record does not show the natural run-off from this drainage. On May 13, 1911, the nine ditches were diverting a total of 110 second-feet. Of this amount, it was estimated that 55 second-feet was returned to the stream above the gage.
Cooperation.—Gage-height record furnished by United States Forest Service.

Sufficient measurements have not been made to develop a rating curve for this station.

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Discharge measurements of Hat Creek at Hat Creek, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 27	G. T. Peekema	2.40	150
May 13	Peekema and Seaborn	2.35	133
Aug. 14	J. E. Stewart	2.02	76

Daily gage height, in feet, of Hat Creek at Hat Creek, Cal., for 1911.

[Fred Seaborn, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	.....	2.45	.....	2.32	2.50	2.03	2.18	2.37	2.52	.....
2	2.42	2.50	.....	.....	.....	2.52	.....	.....	.....	.....	2.52	2.50
3	2.42	.....	.....	.....	.....	2.68	.....	.....	.....	2.37	.....	.....
4	2.42	2.50	.....	2.50	2.32	.....	.....	2.05	.....	.....	2.52	.....
5	2.42	.....	.....	.....	.....	.....	2.70	2.00	2.25	2.50	2.53	.....
6	.....	.....	.....	2.50	2.33	2.70	2.73	.....	2.27	.....	.....	.....
7	2.43	2.41	.....	2.49	.....	.....	.....	.....	2.32	.....	2.53	2.50
8	.....	.....	.....	.....	2.40	.....	2.61	2.05	2.25	.....	.....	2.50
9	.....	2.45	2.38	.....	2.42	2.75	.....	.....	2.25	2.52	2.53	2.50
10	2.41	.....	.....	.....	.....	.....	2.60	.....	.....	.....	2.53	.....
11	.....	2.46	2.40	2.49	2.39	.....	.....	.....	2.27	2.50	2.53	2.50
12	.....	.....	.....	.....	2.33	2.82	.....	2.04	.....	2.51	.....	.....
13	.....	.....	.....	2.44	2.35	2.69	.....	.....	2.28	2.50	2.53	.....
14	.....	2.40	2.38	2.44	.....	.....	.....	2.02	2.20	2.52	2.52	2.50
15	2.47	.....	.....	2.44	.....	2.70	.....	2.03	.....	.....	.....	.....
16	2.43	2.41	2.40	.....	2.12	.....	.....	.....	.....	2.52	2.52	2.50
17	2.45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18	.....	2.41	.....	2.47	2.26	.....	2.63	.....	.....	2.52	2.50	2.51
19	2.54	.....	.....	.....	.....	.....	.....	.....	.....	2.52	2.51	.....
20	.....	.....	2.38	2.47	2.16	2.75	.....	.....	2.15	.....	2.50	2.50
21	2.42	2.41	.....	.....	.....	2.63	.....	.....	2.25	2.47	.....	.....
22	.....	.....	.....	2.47	.....	.....	.....	.....	.....	.....	.....	.....
23	2.47	2.40	.....	.....	2.20	.....	.....	2.09	2.30	.....	.....	2.52
24	2.49	.....	2.40	.....	.....	.....	.....	.....	.....	.....	.....	.....
25	.....	.....	2.40	.....	2.17	.....	.....	.....	2.33	.....	.....	.....
26	2.45	.....	.....	.....	.....	.....	.....	2.00	2.30	2.50	.....	2.52
27	.....	.....	2.40	2.47	.....	2.40	2.30	.....	.....	.....	.....	.....
28	2.47	2.40	2.40	.....	2.24	.....	.....	.....	2.26	.....	2.51	.....
29	.....	.....	.....	2.43	.....	2.50	.....	1.95	2.25	2.50	.....	.....
30	.....	.....	.....	.....	.....	2.48	.....	.....	2.25	2.52	2.50	.....
31	2.48	.....	2.45	.....	.....	.....	.....	2.17	.....	2.52	.....	2.51

RISING RIVER NEAR CASSEL, CAL.

Location.—At highway bridge in sec. 8, T. 35 N., R. 4 E., about half a mile above junction with Hat Creek, and 1¼ miles south of Cassel.

Records available.—August 15 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on downstream side of bridge pier near left bank.

Channel.—Sand and gravel and is fairly permanent.

Discharge measurements.—Made from upstream side of bridge.

Diversions.—Record shows the natural flow of the stream. This stream, which is only about 2 miles long, is fed by springs and its flow is very constant.

The following discharge measurement was made by J. E. Stewart:
August 15, 1911: Gage height, 1.60 feet; discharge, 459 second-feet.

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Daily gage height, in feet, of Rising River near Cassel, Cal., for 1911.

[De Forest Hobson, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.59	1.60	1.53	1.50	16	1.65	1.59	1.55	1.50	1.49
2	.....	1.59	1.60	1.53	1.50	17	1.60	1.59	1.55	1.50	1.49
3	.....	1.59	1.60	1.53	1.50	18	1.60	1.59	1.55	1.50	1.49
4	.....	1.60	1.60	1.52	1.50	19	1.60	1.59	1.55	1.50	1.49
5	.....	1.60	1.60	1.52	1.49	20	1.60	1.59	1.55	1.50	1.49
6	.....	1.60	1.59	1.50	1.49	21	1.60	1.59	1.50	1.50	1.49
7	.....	1.60	1.59	1.50	1.49	22	1.60	1.59	1.50	1.50	1.48
8	.....	1.60	1.59	1.50	1.49	23	1.60	1.59	1.50	1.50	1.47
9	.....	1.60	1.59	1.50	1.49	24	1.60	1.59	1.53	1.50	1.47
10	.....	1.60	1.59	1.50	1.49	25	1.60	1.59	1.55	1.50	1.47
11	.....	1.60	1.59	1.50	1.49	26	1.60	1.60	1.54	1.50	1.48
12	.....	1.60	1.59	1.50	1.49	27	1.59	1.60	1.55	1.50	1.48
13	.....	1.60	1.59	1.50	1.49	28	1.59	1.60	1.55	1.50	1.48
14	.....	1.59	1.55	1.50	1.49	29	1.59	1.60	1.55	1.50	1.48
15	1.60	1.59	1.55	1.50	1.49	30	1.59	1.60	1.52	1.50	1.48
						31	1.59	.....	1.52	.....	1.48

BURNEY CREEK NEAR BURNEY, CAL.

Location.—At highway bridge three-fourths of a mile northwest of Burney, in the SW. ¼ sec. 19, T. 35 N., R. 3 E., 3 miles above Goose Creek and 10 miles above junction with Pit River.

Records available.—August 14 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on upstream end of center pier of bridge.

Channel.—Gravel and sand and probably permanent.

Discharge measurements.—From bridge except at low water when measurements are made by wading.

Diversions.—Two miles above the station about 2 second-feet is diverted for irrigation during the summer months and 0.5 second-foot during the remainder of the year.

The following discharge measurement was made by J. E. Stewart:
August 14, 1911: Gage height, 1.01 feet; discharge, 24 second-feet.

Daily gage height, in feet, of Burney Creek near Burney, Cal., for 1911.

[John Henry Coupe, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.85	1.00	1.10	1.08	16	1.00	0.95	1.12	1.22	1.00
2	.....	.85	1.02	1.10	1.08	17	1.00	.92	1.10	1.18	1.10
3	.....	.88	1.02	1.10	1.05	18	.98	.92	1.10	1.15	1.10
4	.....	.90	1.18	1.10	1.05	19	.98	.92	1.10	1.12	1.10
5	.....	.92	1.10	1.10	1.05	20	.95	.92	1.10	1.12	1.10
6	.....	.98	1.08	1.10	1.20	21	.92	.92	1.10	1.12	1.10
7	.....	.98	1.05	1.10	1.15	22	.80	.95	1.10	1.12	1.10
8	.....	.95	1.05	1.08	1.10	23	.80	.95	1.10	1.10	1.10
9	.....	.95	1.28	1.08	1.10	24	.80	.95	1.10	1.10	1.00
10	.....	.95	1.18	1.60	1.00	25	.80	.95	1.08	1.10	1.00
11	.....	.98	1.12	1.20	1.00	26	.80	1.00	1.10	1.10	1.00
12	.....	.98	1.12	1.15	1.00	27	.80	1.00	1.10	.....	1.00
13	.....	.95	1.12	1.15	1.00	28	.80	1.00	1.10	.....	1.00
14	1.00	.92	1.12	1.12	1.00	29	.80	1.00	1.08	.....	1.00
15	1.00	.92	1.12	1.35	1.00	30	.85	1.00	1.10	1.08	1.00
						31	.85	.....	1.10	.....	1.00

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KOSK CREEK NEAR HENDERSON, CAL.

Location.—At the bridge in sec. 12, T. 37 N., R. 1 W., on the Holm ranch, 4 miles north of Henderson, in Shasta National Forest, and 3½ miles above the mouth of the creek. Baker Creek enters about one-fourth mile below the station.

Records available.—October 1, 1910, to December 31, 1911.

Drainage area.—51.9 square miles.

Gage.—Vertical staff on an alder tree on left bank 100 feet above bridge.

Channel.—Gravel and small bowlders; fairly permanent.

Discharge measurements.—Made from bridge at high water; low-water measurements made by wading below the gage.

Accuracy.—Results are considered good. The discharge has been estimated for days on which the gage was not read.

Cooperation.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Kosk Creek near Henderson, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 26	G. T. Peekema	5.35	788
May 10[a]	do	4.80	521
Aug. 12[b]	J. E. Stewart	3.16	53

[a] Made by wading in NW. ¼ sec. 24, T. 37 N., R. 1 W. [b] Made by wading 50 feet below gage.

Daily gage height, in feet, of Kosk Creek near Henderson, Cal., for 1911.

[H. R. Powers, observer.]

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				4.55						
2										
3		6.15			3.65					
4			5.45		3.55	3.2				
5							3.05	2.95		
6		6.95								
7									2.95	
8			5.1	4.25	3.54					2.93
9						3.2	3.05			
10		6.0	4.8							
11		5.85	4.9	4.25						
12						3.16				2.93
13		5.32	4.78	4.1	3.5				2.95	
14								2.95		
15										
16		5.27			3.46	3.15				
17										
18							3.05			
19					3.4					
20		5.35	5.25					2.95	2.95	
21										
22				3.8	3.36					
23		5.38				3.15			2.95	
24			5.05							
25		5.45	4.95	3.75			3.05			
26	5.35									
27			4.9							
28		5.2							2.95	
29					3.2	3.1				
30		4.95					3.05			
31								2.95		

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Daily discharge, in second-feet, of Kosk Creek near Henderson, Cal., for 1910–11.

[H. R. Powers, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1910.				1910.				1910.			
1	28	30	70	11	35	35	1,000	21	30	25	94
2	28	30	60	12	39	35	500	22	31	24	89
3	29	30	720	13	37	34	300	23	31	22	85
4	32	30	206	14	34	32	200	24	31	293	83
5	31	30	161	15	31	31	200	25	31	180	80
6	30	30	116	16	31	30	150	26	31	100	77
7	29	30	80	17	31	29	150	27	31	80	75
8	29	30	220	18	31	28	150	28	30	120	75
9	29	37	1,000	19	30	27	100	29	30	100	75
10	29	36	1,500	20	30	26	98	30	30	90	70
								31	30	.....	70

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.										
1	.....	1,200	540	398	132	56	45	41	33	33
2	.....	1,350	500	372	129	56	44	38	33	32
3	.....	1,300	630	356	126	56	43	36	33	32
4	.....	1,250	864	340	107	56	42	34	33	32
5	.....	2,300	1,000	326	106	56	42	33	33	31
6	.....	1,810	900	312	106	56	42	33	33	31
7	.....	1,500	800	298	106	56	42	33	33	31
8	.....	1,250	664	283	105	56	42	33	33	31
9	.....	1,050	570	283	104	56	42	33	33	31
10	.....	1,210	510	283	102	54	42	33	33	31
11	.....	1,120	558	283	100	54	42	33	33	31
12	.....	950	530	259	99	52	42	33	33	31
13	.....	788	501	235	98	52	42	33	33	31
14	.....	780	470	226	96	52	42	33	33	31
15	.....	770	450	217	94	52	42	33	33	31
16	.....	759	530	208	92	51	42	33	33	30
17	.....	770	600	200	89	51	42	33	33	30
18	.....	780	1,200	192	85	51	42	33	33	30
19	.....	790	950	184	82	51	42	33	33	30
20	.....	805	748	175	80	51	42	33	33	30
21	.....	810	630	166	78	51	42	33	33	30
22	.....	817	600	157	76	51	42	33	33	29
23	.....	822	620	153	73	51	42	33	33	29
24	.....	843	637	150	70	50	42	33	33	29
25	.....	864	584	146	67	49	42	33	33	29
26	805	1,000	570	143	64	48	42	33	33	29
27	.....	850	558	141	62	48	42	33	33	29
28	.....	720	470	138	59	47	42	33	33	29
29	.....	650	400	136	56	46	42	33	33	29
30	.....	584	400	134	56	46	42	33	33	29
31	.....	.....	400	.....	56	45	.....	33	.....	29

NOTE.—Daily discharge determined from a fairly well-defined rating curve; discharge Nov. 26 to 29, Dec. 1 to 7, and 9 to 19, 1910, estimated from records of discharge of Pit River near Ydalpom, and precipitation records.

For days on which gage was not read during April and May, 1911, the discharge was determined from hydrographic comparison with McCloud River at Baird. Daily discharge interpolated for all other days on which gage was not read from June to December. Estimates of daily discharge for days on which gage was not read are roughly approximate and should be used with caution.

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Monthly discharge of Kosk Creek near Henderson, Cal., for 1910–11.

[Drainage area, 51.9 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
October	39	28	30.9	0.595	0.69	1,900	B.
November	293	22	55.1	1.06	1.18	3,280	C.
December	1,500	60	253	4.87	5.62	15,600	C.
1911.							
April	2,300	584	1,020	19.7	21.98	60,700	B.
May	1,200	400	625	12.0	13.83	38,400	B.
June	398	134	230	4.43	4.94	13,700	B.
July	132	56	88.9	1.71	1.97	5,470	B.
August	56	45	51.8	1.00	1.15	3,190	B.
September	45	42	42.2	.813	.91	2,510	B.
October	41	33	33.5	.645	.74	2,060	B.
November	33	33	33.0	.636	.71	1,960	B.
December	33	29	30.3	.584	.67	1,860	B.
The period						130,000	

MONTGOMERY CREEK AT MONTGOMERY CREEK, CAL.

Location.—At highway bridge in sec. 36, T. 35 N., R. 1 W., about one-fourth mile south of Montgomery Creek post office, and 2 miles above junction with Pit River.

Records available.—August 11 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on a large alder tree on left bank 70 feet below the bridge.

Channel.—Small bowlders and gravel and is rough.

Discharge measurements.—Made by wading or from highway bridge.

Diversions.—About 5 miles above the station, the Terry Lumber Co. diverts water from this stream which is discharged into Little Cow Creek. During the logging season, from June to December, this diversion is from 8 to 10 second-feet. For the remainder of the year the amount is reduced to about 6 second-feet.

The following discharge measurement was made by J. E. Stewart by wading 80 feet below the gage:

August 11, 1911: Gage height, 0.74 foot; discharge, 23 second-feet.

Daily gage height, in feet, of Montgomery Creek at Montgomery Creek, Cal., for 1911.

[Edwin Fowler, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.64	0.70	0.66	0.62	16	0.69	0.62	0.68	0.69	0.64
2	.....	.63	.65	.66	.64	17	.69	.62	.69	.68	.66
3	.....	.62	.65	.66	.64	18	.69	.61	.66	.68	.66
4	.....	.61	.70	.72	.65	19	.69	.68	.66	.68	.63
5	.....	.61	.66	.68	.67	20	.70	.62	.66	.66	.64
6	.....	.61	.64	.64	.64	21	.69	.68	.66	.65	.66
7	.....	.62	.65	.65	.62	22	.69	.62	.69	.64	.71
8	.....	.60	.71	.68	.62	23	.69	.60	.68	.65	.67
9	.....	.61	.78	.69	.64	24	.69	.60	.66	.64	.64
10	.....	.61	.70	.75	.62	25	.69	.61	.68	.64	.65
11	0.72	.60	.70	.68	.62	26	.69	.72	.68	.66	.68
12	.72	.60	.70	.68	.62	27	.69	.70	.69	.66	.72
13	.71	.61	.70	.68	.62	28	.69	.64	.68	.64	.82
14	.69	.62	.70	.68	.62	29	.68	.68	.69	.64	.88
15	.70	.62	.71	.80	.62	30	.67	.64	.68	.64	.72
						31	.62	.....	.66	.....	.81

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SQUAW CREEK NEAR YDALPOM, CAL.

Location.—At the highway bridge in sec. 29, T. 34 N., R. 3 W., three-fourths of a mile southwest of Ydalpom (Copper City), and three-fourths of a mile above junction with Pit River.

Records available.—October 4 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on upstream end of right pier of bridge.

Channel.—Gravel and cobblestones; will shift slightly at high stages.

Discharge measurements.—Made from the bridge or by wading.

Diversions.—One small ditch diverts water for irrigation above the station.

Discharge measurements of Squaw Creek near Ydalpom, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 2	G. T. Peekema	3.71	557
Oct. 4[a]	do	1.61	35

[a] Made by wading one-half mile below gage.

Daily gage height, in feet, of Squaw Creek near Ydalpom, Cal., for 1911.

[Mrs. Lem Williams, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	1.6	1.6	11	1.9	1.8	1.6	21	1.6	1.6	1.6
2	.....	1.6	1.6	12	1.8	1.7	1.6	22	1.6	1.6	1.6
3	.....	1.6	1.6	13	1.7	1.6	1.7	23	1.6	1.6	1.6
4	1.6	1.6	1.6	14	1.5	1.6	1.7	24	1.6	1.6	1.5
5	1.6	1.6	1.9	15	1.6	2.0	1.6	25	1.6	1.6	1.5
6	1.6	1.6	1.8	16	1.6	1.8	1.6	26	1.7	1.6	1.5
7	1.5	1.6	1.7	17	1.6	1.7	1.6	27	1.6	1.6	1.6
8	1.5	1.6	1.6	18	1.6	1.7	1.6	28	1.6	1.6	1.6
9	1.5	1.6	1.6	19	1.6	1.7	1.6	29	1.6	1.6	1.7
10	1.5	2.1	1.6	20	1.6	1.6	1.6	30	1.6	1.6	1.7
								31	1.6	.....	1.8

M'CLOUD RIVER AT BAIRD, CAL.

Location.—At the United States fishery at Baird, in the NW. ¼ sec. 23, T. 34 N., R. 4 W., about 2 miles above junction with Pit River. Bailey Creek enters about 2,000 feet above and Johns Creek 2,000 feet below the station.

Records available.—December 22, 1910, to December 31, 1911.

Drainage area.—665 square miles.

Gage.—Vertical staff fastened to an alder tree on right bank, 600 feet above the hatchery.

Channel.—Gravel and cobblestones; permanent.

Discharge measurements.—Made from car and cable 100 feet below gage. Previous to September 27, 1911, measurements were made from a boat at the same section.

Accuracy.—Results are good.

Cooperation.—Gage-height record furnished by G. H. Lambson, superintendent of United States fishery.

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Discharge measurements of McCloud River at Baird, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 1 [a]	G. T. Peekema	5.02	4,270
May 23 [a]	do	4.57	3,260
Sept 27 [b]	do	2.00	1,270

[a] Made from boat about 100 feet below the gage. [b] Made from cable.

Daily gage height, in feet, of McCloud River at Baird, Cal., for 1911.

[G. H. Lambson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.97	6.85	2.60	5.05	4.20	4.30	2.90	2.43	2.30	2.28	2.18	2.08
2	1.95	6.50	2.62	5.15	4.19	4.30	2.87	2.41	2.30	2.27	2.18	2.08
3	1.94	6.52	2.59	5.10	4.40	4.20	2.85	2.40	2.29	2.25	2.17	2.08
4	1.91	6.52	2.79	5.00	4.90	4.22	2.83	2.40	2.28	2.23	2.15	2.08
5	1.91	5.00	4.40	7.60	5.02	4.18	2.85	2.39	2.27	2.20	2.15	2.08
6	1.91	4.90	7.45	7.00	4.80	4.08	2.85	2.39	2.26	2.20	2.15	2.28
7	1.91	4.40	9.40	6.10	4.40	4.00	2.83	2.39	2.26	2.21	2.15	2.15
8	1.91	4.10	7.45	5.65	4.39	3.92	2.78	2.38	2.26	2.21	2.15	2.12
9	1.93	3.75	6.25	5.60	4.29	3.88	2.78	2.37	2.26	2.41	2.16	2.08
10	1.94	3.60	5.40	5.85	4.10	3.80	2.75	2.37	2.27	2.21	2.17	2.08
11	2.54	5.20	4.80	5.50	4.08	3.80	2.71	2.36	2.27	2.21	2.18	2.08
12	2.12	5.30	4.50	5.15	4.09	3.80	2.70	2.36	2.27	2.18	2.18	2.08
13	2.09	5.00	4.30	4.85	4.10	3.72	2.70	2.36	2.27	2.20	2.19	2.08
14	2.09	4.30	4.10	4.60	4.01	3.72	2.69	2.36	2.27	2.21	2.20	2.08
15	2.35	3.90	4.10	4.40	3.97	3.70	2.67	2.36	2.27	2.21	2.40	2.08
16	2.29	3.60	4.09	4.30	4.10	3.62	2.65	2.36	2.26	2.19	2.26	2.04
17	2.20	3.35	4.09	4.25	4.28	3.50	2.65	2.35	2.25	2.15	2.22	2.04
18	2.29	3.25	4.05	4.15	5.30	3.50	2.68	2.35	2.24	2.15	2.22	2.04
19	4.30	3.10	4.11	4.25	4.95	3.42	2.65	2.33	2.25	2.24	2.20	2.04
20	5.20	2.95	4.19	4.18	4.60	3.38	2.65	2.32	2.25	2.16	2.17	2.04
21	3.31	3.00	4.30	4.20	4.50	3.30	2.59	2.32	2.25	2.22	2.17	2.02
22	3.10	2.90	4.50	4.25	4.50	3.27	2.57	2.32	2.24	2.26	2.17	2.02
23	2.75	2.90	4.60	4.40	4.52	3.18	2.55	2.31	2.23	2.28	2.16	2.00
24	2.30	2.82	4.90	4.50	4.54	3.18	2.52	2.31	2.21	2.37	2.18	2.00
25	2.93	2.80	4.70	4.70	4.41	3.12	2.54	2.31	2.22	2.22	2.16	2.00
26	3.52	2.78	4.45	4.90	4.30	3.08	2.51	2.31	2.29	2.23	2.14	2.00
27	4.52	2.71	4.25	4.75	4.19	3.05	2.49	2.31	2.27	2.22	2.12	2.00
28	5.80	2.68	4.15	4.45	4.10	3.00	2.47	2.30	2.25	2.26	2.08	2.00
29	4.72	.....	4.10	4.30	4.10	2.98	2.45	2.30	2.22	2.18	2.08	2.00
30	5.90	.....	4.60	4.21	4.12	2.95	2.45	2.30	2.20	2.18	2.07	2.00
31	6.80	.....	4.90	.....	4.15	.....	2.45	2.30	.....	2.18	.....	2.00

Daily discharge, in second-feet, of McCloud River at Baird, Cal., for 1910–11.

Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.
1910.		1910.		1910.		1910.		1910.		1910.	
1	.....	6	.....	11	.....	16	.....	21	.....	26	1,280
2	.....	7	.....	12	.....	17	.....	22	1,320	27	1,270
3	.....	8	.....	13	.....	18	.....	23	1,320	28	1,270
4	.....	9	.....	14	.....	19	.....	24	1,310	29	1,270
5	.....	10	.....	15	.....	20	.....	25	1,290	30	1,270
										31	1,260

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Daily discharge, in second-feet, of McCloud River at Baird, Cal., for 1910–11—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	1,260	7,020	1,600	4,120	3,040	3,160	1,810	1,500	1,420	1,410	1,350	1,300
2	1,260	6,350	1,610	4,260	3,030	3,160	1,800	1,490	1,420	1,400	1,350	1,300
3	1,250	6,390	1,590	4,190	3,280	3,040	1,780	1,480	1,410	1,390	1,340	1,300
4	1,240	6,390	1,730	4,050	3,910	3,060	1,760	1,480	1,410	1,380	1,340	1,300
5	1,240	4,050	3,280	8,500	4,060	3,020	1,780	1,470	1,400	1,360	1,340	1,300
6	1,240	3,910	8,200	7,300	3,780	2,910	1,780	1,470	1,400	1,360	1,340	1,410
7	1,240	3,280	12,600	5,670	3,280	2,820	1,760	1,470	1,400	1,370	1,340	1,340
8	1,240	2,930	8,200	4,980	3,270	2,730	1,730	1,470	1,400	1,370	1,340	1,320
9	1,250	2,550	5,920	4,900	3,150	2,690	1,730	1,460	1,400	1,490	1,340	1,300
10	1,250	2,400	4,610	5,280	2,930	2,600	1,700	1,460	1,400	1,370	1,340	1,300
11	1,560	4,330	3,780	4,750	2,910	2,600	1,680	1,460	1,400	1,370	1,350	1,300
12	1,320	4,470	3,400	4,260	2,920	2,600	1,670	1,460	1,400	1,350	1,350	1,300
13	1,310	4,050	3,160	3,840	2,930	2,520	1,670	1,460	1,400	1,360	1,360	1,300
14	1,310	3,160	2,930	3,520	2,830	2,520	1,660	1,460	1,400	1,370	1,360	1,300
15	1,450	2,710	2,930	3,280	2,790	2,500	1,650	1,460	1,400	1,370	1,480	1,300
16	1,410	2,400	2,920	3,160	2,930	2,420	1,640	1,460	1,400	1,360	1,400	1,290
17	1,360	2,160	2,920	3,100	3,140	2,300	1,640	1,450	1,390	1,340	1,370	1,290
18	1,410	2,080	2,880	2,980	4,470	2,300	1,660	1,450	1,380	1,340	1,370	1,290
19	3,160	1,960	2,940	3,100	3,980	2,230	1,640	1,440	1,390	1,380	1,370	1,290
20	4,330	1,840	3,030	3,020	3,520	2,190	1,640	1,430	1,390	1,340	1,340	1,290
21	2,130	1,880	3,160	3,040	3,400	2,120	1,590	1,430	1,390	1,370	1,340	1,280
22	1,960	1,810	3,400	3,100	3,400	2,100	1,580	1,430	1,380	1,400	1,340	1,280
23	1,700	1,810	3,520	3,280	3,420	2,020	1,570	1,430	1,380	1,410	1,340	1,270
24	1,420	1,750	3,910	3,400	3,450	2,020	1,550	1,430	1,370	1,460	1,350	1,270
25	1,830	1,740	3,650	3,650	3,290	1,980	1,560	1,430	1,370	1,370	1,340	1,270
26	2,320	1,730	3,340	3,910	3,160	1,940	1,550	1,430	1,410	1,380	1,330	1,270
27	3,420	1,680	3,100	3,720	3,030	1,920	1,530	1,430	1,400	1,370	1,320	1,270
28	5,200	1,660	2,980	3,340	2,930	1,880	1,520	1,420	1,390	1,400	1,300	1,270
29	3,680	.....	2,930	3,160	2,930	1,870	1,510	1,420	1,370	1,350	1,300	1,270
30	5,350	.....	3,520	3,050	2,950	1,840	1,510	1,420	1,360	1,350	1,300	1,270
31	6,920	.....	3,910	.....	2,980	.....	1,510	1,420	.....	1,350	.....	1,270

NOTE.—Daily discharge determined from a well-defined rating curve.

Monthly discharge of McCloud River at Baird, Cal., for 1910–11.

[Drainage area, 665 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
December 22–31	1,320	1,260	1,290	1.94	0.72	25,600	A.
1911.							
January	6,920	1,240	2,160	3.25	3.75	133,000	A.
February	7,020	1,660	3,160	4.75	4.95	176,000	A.
March	12,600	1,590	3,800	5.71	6.58	234,000	A.
April	8,500	2,980	4,060	6.11	6.82	242,000	A.
May	4,470	2,790	3,260	4.90	5.65	200,000	A.
June	3,160	1,840	2,440	3.67	4.10	145,000	A.
July	1,810	1,510	1,650	2.48	2.86	101,000	A.
August	1,500	1,420	1,450	2.18	2.51	89,200	B.
September	1,420	1,360	1,390	2.09	2.33	82,700	B.
October	1,490	1,340	1,380	2.08	2.40	84,800	B.
November	1,480	1,300	1,350	2.03	2.26	80,300	B.
December	1,410	1,270	1,290	1.94	2.24	79,300	B.
The year	12,600	1,240	2,280	3.43	46.45	1,650,000	

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CLEAR CREEK NEAR SHASTA, CAL.

Location.—At suspension footbridge, in the SE. ¼ sec. 17, T. 32 N., R. 6 W., at Whiskeytown and 5 miles northwest of Shasta. Brandy Creek and Whisky Creek enter about 1,000 feet below the station.

Records available.—August 31 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff, in three sections, on right bank. Low-water section is fastened to a large rock 60 feet below bridge. High-water sections are 30 feet below bridge.

Channel.—Solid rock and bowlders; permanent.

Discharge measurements.—Made from suspension bridge at medium and high stages; at low water, measurements are made by wading above the bridge.

Diversions.—Several small ditches divert water above the station.

Discharge measurements of Clear Creek near Shasta, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 30[a]	G. T. Peekema	2.98	21
Sept. 27[b]	do	3.18	43

[a] Made by wading 600 feet above gage. [b] Made by wading 200 feet above gage.

Daily gage height, in feet, of Clear Creek near Shasta, Cal., for 1911.

[J. F. Schilling, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	2.8	2.8	2.8	2.8	16	.....	2.9	2.8	2.8	2.8
2	.....	3.0	2.8	2.8	2.8	17	.....	2.9	2.8	2.8	2.8
3	.....	2.8	2.8	2.8	2.8	18	.....	2.9	2.8	2.8	2.8
4	.....	2.8	2.8	2.8	2.8	19	.....	2.9	2.8	2.8	2.8
5	.....	2.8	2.8	2.8	2.8	20	.....	2.8	2.8	2.8	2.8
6	.....	2.9	2.8	2.8	3.1	21	.....	2.8	2.8	2.8	2.8
7	.....	2.9	2.8	2.8	3.0	22	.....	2.8	2.8	2.8	2.8
8	.....	3.0	2.8	2.8	2.8	23	.....	2.8	2.8	2.8	2.8
9	.....	3.0	2.8	2.8	2.8	24	.....	2.8	2.8	2.8	2.8
10	.....	2.9	2.8	2.8	2.8	25	.....	2.9	2.8	2.8	2.8
11	.....	2.9	2.8	2.8	2.8	26	.....	2.9	2.8	2.8	2.8
12	.....	3.0	2.8	2.8	2.8	27	.....	2.9	2.8	2.8	3.2
13	.....	2.9	2.8	2.8	2.8	28	.....	2.8	2.8	2.8	3.2
14	.....	2.9	2.8	2.8	2.8	29	.....	2.8	2.8	2.8	3.4
15	.....	2.9	2.8	2.8	2.8	30	3.0	2.8	2.8	2.8	3.5
						31	3.0	.....	2.8	.....	3.6

NOTE.—The accuracy of the gage readings during 1911 is doubtful.

COW CREEK AND TRIBUTARIES.

COW CREEK AT MILLVILLE, CAL.

Location.—At highway bridge in the NW. ¼ sec. 14, T. 31 N., R. 3 W., in Millville. Clover Creek enters three-fourths mile below the station.

Records available.—August 10 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on large oak tree on right bank, 6 feet below bridge.

Channel.—Gravel and small bowlders, and will shift at high stages.

Discharge measurements.—Made from bridge at high stages. At low water measurements are made by wading about 500 feet below the bridge.

Diversions.—Several small ditches divert water for irrigation above the station.

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Discharge measurements of Cow Creek at Millville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 10[a]	J. E. Stewart	0.75	63
Aug. 18[a]	do	.75	63

[a] Made by wading 500 feet below gage.

Daily gage height, in feet, of Cow Creek at Millville, Cal., for 1911.

[Mrs. M. D. Rathbun, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.72	0.85	0.90	1.00	16	0.80	0.75	0.90	1.05	1.10
2	.....	.70	.90	.90	1.00	17	.80	.75	.90	1.25	1.02
3	.....	.72	.85	.95	1.00	18	.70	.75	.90	1.00	1.00
4	.....	.70	.85	.90	1.00	19	.70	.78	.90	1.00	1.00
5	.....	.70	.85	.95	1.10	20	.70	.78	.90	1.00	.90
6	.....	.72	.85	.95	1.10	21	.75	.80	.90	1.00	1.00
7	.....	.74	.85	.95	1.00	22	.80	.82	.90	1.00	1.00
8	.....	.72	.88	.95	1.00	23	.75	.84	.90	1.00	1.00
9	.....	.72	1.32	.98	1.00	24	.75	.81	.90	1.00	1.00
10	0.75	.75	1.00	1.25	1.00	25	.75	.82	.90	1.00	.90
11	.80	.88	.95	.98	1.00	26	.70	1.00	.90	1.00	.90
12	.80	.74	.92	.94	1.00	27	.70	.84	.90	1.00	1.05
13	.80	.78	.92	1.00	1.00	28	.65	.85	.90	1.00	1.10
14	.75	.76	.90	1.30	1.00	29	.65	.85	.90	1.00	1.00
15	.75	.75	.90	1.05	1.00	30	.70	.85	.90	1.00	1.00
						31	.70	.....	.90	.....	1.10

CLOVER CREEK AT MILLVILLE, CAL.

Location.—At highway bridge, in the SE. ¼ sec. 10, T. 31 N., R. 3 W., in Millville, one-fourth mile above junction with Cow Creek.

Records available.—August 10 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on downstream end of bridge pier near left bank.

Channel.—Sand and gravel, and appears permanent.

Discharge measurement.—Made by wading.

Diversions.—Water is diverted for irrigation above the station.

The following discharge measurement was made by J. E. Stewart:
August 10, 1911: Gage height, 1.90 feet; discharge, 5.7 second-feet.

Daily gage height, in feet, of Clover Creek at Millville, Cal., for 1911.

[H. H. Butzbach, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.95	2.10	2.10	2.15	16	1.95	2.00	2.10	2.28	2.18
2	.....	1.92	2.15	2.10	2.15	17	1.98	2.00	2.10	2.20	2.28
3	.....	1.92	2.10	2.10	2.15	18	2.00	2.00	2.08	2.20	2.25
4	.....	1.95	2.10	2.10	2.15	19	1.95	1.90	2.08	2.18	2.25
5	.....	1.92	2.12	2.10	2.15	20	1.95	1.90	2.08	2.18	2.25
6	.....	1.95	2.10	2.10	2.15	21	1.95	1.92	2.10	2.15	2.25
7	.....	1.98	2.10	2.10	2.18	22	1.92	1.92	2.10	2.20	2.25
8	.....	2.00	2.08	2.10	2.18	23	1.92	1.92	2.10	2.20	2.25
9	.....	1.95	2.50	2.10	2.18	24	1.92	1.95	2.10	2.15	2.15
10	1.90	1.98	2.20	2.10	2.18	25	1.92	1.98	2.10	2.18	2.15
11	1.90	2.00	2.18	2.10	2.18	26	1.92	2.15	2.10	2.15	2.15
12	1.90	2.00	2.18	2.15	2.18	27	1.92	2.12	2.10	2.18	2.15
13	2.00	2.00	2.12	2.15	2.18	28	1.95	2.10	2.10	2.18	2.15
14	1.92	2.00	2.12	2.15	2.15	29	1.95	2.10	2.10	2.18	2.22
15	1.92	2.02	2.10	2.18	2.15	30	1.92	2.10	2.10	2.18	2.22
						31	1.95	.....	2.10	.....	2.30

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LITTLE COW CREEK AT PALO CEDRO, CAL.

Location.—At highway bridge, in sec. 5, T. 31 N., R. 3 W., one-fourth mile east of Palo Cedro and one-fourth mile above junction with Cow Creek.

Records available.—August 9 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on bridge pier near right bank.

Channel.—Gravel and small bowlders; may shift slightly at high stages.

Discharge measurements.—From bridge, except at low stages, when measurements are made by wading above the gage.

Diversions.—A small amount of water is pumped from this stream for irrigation. The Terry Lumber Co.'s flume, which is supplied by a diversion from Montgomery Creek, discharges into this stream. From June to December this amounts to 8 or 10 second-feet. For the remainder of the year this is reduced to about 6 second-feet.

The following discharge measurement was made by J. E. Stewart by wading 600 feet above the gage:

August 9, 1911: Gage height, 1.62 feet; discharge, 8.7 second-feet.

Daily gage height, in feet, of Little Cow Creek at Palo Cedro, Cal., for 1911.

[Richard Logan, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.5	1.7	1.9	1.9	16	1.6	1.6	1.8	2.1	1.95
2	.....	1.6	1.75	1.85	1.95	17	1.6	1.6	1.8	2.1	1.95
3	.....	1.5	1.8	1.9	1.95	18	1.6	1.55	1.8	2.0	1.9
4	.....	1.5	1.8	1.9	1.95	19	1.6	1.55	1.8	1.95	2.0
5	.....	1.55	1.8	1.85	1.95	20	1.6	1.5	1.8	1.9	2.0
6	.....	1.55	1.8	1.9	1.9	21	1.5	1.6	1.8	1.9	2.0
7	.....	1.55	1.75	1.9	2.0	22	1.65	1.65	1.8	1.95	2.0
8	.....	1.6	1.75	1.9	1.9	23	1.55	1.6	1.8	1.95	2.0
9	1.6	1.6	1.8	1.9	1.95	24	1.6	1.6	1.8	1.9	2.0
10	1.65	1.65	1.85	1.9	1.95	25	1.6	1.7	1.9	1.9	1.9
11	1.6	1.65	1.85	1.95	1.9	26	1.55	1.75	1.85	1.9	1.9
12	1.5	1.6	1.85	1.95	1.9	27	1.55	1.8	1.8	1.95	1.9
13	1.58	1.65	1.85	1.95	1.9	28	1.6	1.75	1.8	1.95	1.9
14	1.48	1.65	1.85	1.95	1.9	29	1.6	1.75	1.85	1.9	2.0
15	1.5	1.6	1.8	2.0	1.9	30	1.6	1.65	1.9	1.95	2.0
						31	1.55	.....	1.9	.....	2.0

BEAR CREEK NEAR MILLVILLE, CAL.

Location.—At highway bridge, in sec. 36, T. 31 N., R. 3 W., 4 miles southeast of Millville and 5 miles above junction with Sacramento River.

Records available.—August 19 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on upstream side of bridge pier near left bank.

Channel.—Small bowlders; rough.

Discharge measurements.—Made by wading about 50 feet above the gage, except at high stages, when measurements are made from the bridge.

The following discharge measurement was made by J. E. Stewart:

August 19, 1911: Gage height, 0.67 foot; discharge, 33 second-feet.

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Daily gage height, in feet, of Bear Creek near Millville, Cal., for 1911.

[C. L. Lack and Fred Dersch, observers.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.68	0.85	1.00	1.80	16	.....	0.78	0.92	1.80	1.75
2	.....	.68	.85	1.00	1.80	17	.....	.78	.92	1.80	1.80
3	.....	.68	.85	1.00	1.80	18	.....	.78	.92	1.80	1.75
4	.....	.70	.85	1.00	1.80	19	0.68	.78	.92	1.80	1.75
5	.....	.70	.88	1.10	1.80	20	.68	.78	.92	1.80	1.75
6	.....	.70	.88	1.00	1.80	21	.68	.78	.92	1.80	1.75
7	.....	.70	.88	1.00	1.80	22	.68	.78	.95	1.80	1.70
8	.....	.70	.88	1.00	1.80	23	.68	.78	.95	1.80	1.70
9	.....	.70	1.38	1.00	1.80	24	.68	.78	.98	1.80	1.65
10	.....	.75	1.40	1.75	1.80	25	.68	.80	1.00	1.80	1.65
11	.....	.75	.98	1.75	1.80	26	.68	.88	1.00	1.80	1.65
12	.....	.75	.98	1.75	1.80	27	.68	.88	1.00	1.80	1.65
13	.....	.78	.98	1.75	1.75	28	.68	.85	1.00	1.80	1.65
14	.....	.78	.98	1.75	1.75	29	.68	.85	1.00	1.80	1.65
15	.....	.78	.98	1.75	1.75	30	.68	.85	1.00	1.80	1.65
						31	.68	.....	1.00	.....	1.65

NOTE.—Rise in gage height Nov. 10 caused by a loose rock dam which was placed across the creek 40 feet below the gage to protect bridge piers.

NORTH FORK OF COTTONWOOD CREEK AT ONO, CAL.

Location.—At the highway bridge near the center of sec. 11, T. 30 N., R. 7 W., one-fourth mile southwest of Ono. Byron Creek enters just above and Eagle Creek one-half mile below the station.

Records available.—October 27, 1907, to December 31, 1911.

Drainage area.—52 square miles.

Gage.—Vertical staff on left face of middle pier of bridge.

Channel.—Gravel and small bowlders and subject to slight change at high stages. Current at angle to bridge in right channel.

Discharge measurements.—Made from downstream side of bridge, except at low water when wading measurements are made about 100 feet below the gage.

Diversions.—Several small ditches divert water from this stream above the station. In September, 1908, these diversions amounted to 14 second-feet.

Accuracy.—Results are good.

Discharge measurements of North Fork of Cottonwood Creek at Ono, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 8[a]	H. D. McGlashan	6.30	813
Oct. 11[b]	J. E. Stewart	4.36	11

[a] Conditions good except for right channel. Gage difficult to read accurately at this stage owing to roughness of water surface.

[b] Made by wading about 50 feet below gage.

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Daily gage height, in feet, of North Fork of Cottonwood Creek at Ono, Cal., for 1911.

[F. J. Wheelock, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.70	5.70	5.20	5.65	5.45	5.10	4.75	4.32	4.25	4.38	4.50	4.45
2	4.65	5.70	5.20	5.65	5.45	5.05	4.68	4.30	4.22	4.40	4.45	4.40
3	4.60	5.70	5.50	5.65	5.42	5.05	4.62	4.30	4.28	4.40	4.42	4.40
4	4.62	5.68	6.50	5.72	5.40	5.02	4.65	4.28	4.20	4.40	4.40	4.40
5	4.65	5.62	6.85	5.55	5.40	5.00	4.58	4.25	4.20	4.35	4.40	4.45
6	4.65	5.52	7.75	5.95	5.35	5.00	4.58	4.25	4.22	4.38	4.40	4.78
7	4.65	5.42	6.90	5.85	5.35	5.02	4.58	4.25	4.25	4.35	4.38	4.55
8	4.65	5.40	6.30	5.85	5.35	5.00	4.52	4.25	4.20	4.38	4.40	4.50
9	4.65	5.30	5.95	5.80	5.32	5.00	4.52	4.25	4.22	4.40	4.40	4.45
10	4.60	5.55	5.90	5.80	5.30	5.00	4.52	4.25	4.28	4.35	4.40	4.45
11	4.85	5.58	5.80	5.75	5.30	4.92	4.51	4.25	4.30	4.35	4.40	4.45
12	4.72	5.85	5.80	5.70	5.28	4.92	4.51	4.25	4.30	4.35	4.40	4.45
13	4.78	5.70	5.75	5.65	5.25	4.88	4.51	4.25	4.30	4.35	4.40	4.45
14	4.85	5.50	5.75	5.60	5.25	4.88	4.51	4.25	4.30	4.40	4.40	4.45
15	4.85	5.48	5.70	5.60	5.25	4.88	4.49	4.25	4.30	4.40	4.60	4.45
16	4.80	5.42	5.70	5.55	5.30	4.85	4.49	4.25	4.25	4.50	4.60	4.50
17	4.80	5.38	5.70	5.55	5.35	4.82	4.46	4.25	4.25	4.50	4.50	4.48
18	4.85	5.32	5.70	5.55	5.35	4.82	4.50	4.25	4.25	4.50	4.48	4.45
19	6.75	5.30	5.70	5.52	5.30	4.82	4.45	4.25	4.25	4.45	4.45	4.45
20	5.80	5.30	5.70	5.50	5.30	4.78	4.45	4.25	4.25	4.45	4.45	4.45
21	5.35	5.30	5.70	5.50	5.25	4.78	4.45	4.25	4.25	4.45	4.45	4.45
22	5.20	5.28	5.70	5.50	5.25	4.78	4.45	4.25	4.25	4.45	4.45	4.45
23	5.12	5.25	5.70	5.50	5.25	4.78	4.45	4.22	4.25	4.45	4.45	4.45
24	5.15	5.25	5.70	5.50	5.22	4.78	4.45	4.20	4.25	4.45	4.45	4.45
25	5.15	5.22	5.70	5.50	5.20	4.78	4.45	4.20	4.35	4.48	4.45	4.45
26	5.15	5.20	5.65	5.52	5.20	4.75	4.40	4.20	4.45	4.50	4.45	4.45
27	5.5	5.20	5.65	5.50	5.20	4.72	4.35	4.20	4.40	4.50	4.45	4.52
28	5.95	5.20	5.65	5.50	5.15	4.72	4.35	4.20	4.38	4.50	4.45	4.60
29	5.85	.....	5.65	5.45	5.12	4.72	4.35	4.20	4.35	4.50	4.45	4.60
30	5.80	.....	5.65	5.45	5.10	4.78	4.35	4.20	4.35	4.50	4.45	4.60
31	5.80	.....	5.65	.....	5.10	.....	4.35	4.25	.....	4.50	.....	4.60

Daily discharge, in second-feet, of North Fork of Cottonwood Creek at Ono, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	36	349	143	324	231	115	43	8.8	6.5	11	17	14
2	30	349	143	324	231	102	34	8.0	5.6	12	14	12
3	25	349	252	324	219	102	27	8.0	7.4	12	13	12
4	27	339	950	360	211	95	30	7.4	5.0	12	12	12
5	30	308	1,320	275	211	90	23	6.5	5.0	10	12	14
6	30	261	2,460	501	193	90	23	6.5	5.6	11	12	47
7	30	219	1,380	436	193	95	23	6.5	6.5	10	11	21
8	30	211	770	436	193	90	19	6.5	5.0	11	12	17
9	30	175	501	405	182	90	19	6.5	5.6	12	12	14
10	25	275	467	405	175	90	19	6.5	7.4	10	12	14
11	58	289	405	377	175	72	18	6.5	8.0	10	12	14
12	39	436	405	349	169	72	18	6.5	8.0	10	12	14
13	47	349	377	324	159	64	18	6.5	8.0	10	12	14
14	58	252	377	298	159	64	18	6.5	8.0	12	12	14
15	58	244	349	298	159	64	16	6.5	8.0	12	25	14
16	50	219	349	275	175	59	16	6.5	6.5	17	25	17
17	50	204	349	275	193	54	15	6.5	6.5	17	17	16
18	58	182	349	275	193	54	17	6.5	6.5	17	16	14
19	1,220	175	349	261	175	54	14	6.5	6.5	14	14	14
20	405	175	349	252	175	47	14	6.5	6.5	14	14	14
21	193	175	349	252	159	47	14	6.5	6.5	14	14	14
22	143	169	349	252	159	47	14	6.5	6.5	14	14	14
23	121	159	349	252	159	47	14	5.6	6.5	14	14	14
24	129	159	349	252	149	47	14	5.0	6.5	14	14	14
25	129	149	349	252	143	47	14	5.0	10	16	14	14
26	129	143	324	261	143	43	12	5.0	14	17	14	14
27	252	143	324	252	143	39	10	5.0	12	17	14	19
28	501	143	324	252	129	39	10	5.0	11	17	14	25
29	436	.....	324	231	120	39	10	5.0	10	17	14	25
30	405	.....	324	231	115	47	10	5.0	10	17	14	25
31	405	.....	324	.....	115	.....	10	6.5	.....	17	.....	25

NOTE.—Daily discharge determined from a rating curve well defined below 1,500 second-feet.

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Monthly discharge of North Fork of Cottonwood Creek at Ono, Cal., for 1911.

[Drainage area, 52 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	1,220	25	167	3.21	3.70	10,300	A.
February	349	143	236	4.54	4.73	13,100	A.
March	2,460	143	508	9.77	11.26	31,200	A.
April	501	231	309	5.94	6.63	18,400	A.
May	231	115	171	3.29	3.79	10,500	A.
June	115	39	66.7	1.28	1.43	3,970	A.
July	43	10	17.9	.344	.40	1,100	B.
August	8.8	5	6.33	.122	.14	389	C.
September	14	5	7.50	.144	.16	446	C.
October	17	10	13.5	.260	.30	830	B.
November	25	11	14.2	.273	.30	845	B.
December	47	12	16.9	.325	.37	1,040	B.
The year	2,460	5	127	2.44	33.21	92,100	

MILL CREEK NEAR LOS MOLINOS, CAL.

Location.—At suspension footbridge one-fourth mile above Los Molinos Land Co.'s diversion dam, in NE. ¼ sec. 1, T. 25 N., R. 2 W., 4½ miles northeast of Los Molinos, and 5 miles east of Tehama.

Records available.—August 9, 1909 to December 31, 1911.

Drainage area.—173 square miles.

Gage.—Inclined staff on right bank at footbridge.

Channel.—Cemented gravel and small bowlders and permanent.

Discharge measurements.—Made from suspension footbridge at gage and by wading at low stages.

Accuracy.—At medium and high stages the current is very swift. Rating curve is only fairly well defined as measurements are somewhat scattering. Results are believed to be reliable.

Cooperation.—Gage-height record and occasional measurements furnished by the Los Molinos Land Co.

Discharge measurements of Mill Creek near Los Molinos, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 23[a]	J. E. Stewart	0.85	170
Oct. 10[a]	....do	.82	157
Oct. 19[a]	G. T. Peekema	.69	123
Dec. 8[a]	....do	.69	124

[a] Made by wading at footbridge.

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Discharge measurements of Mill Creek near Los Molinos, Cal., in 1909–1911, made by Los Molinos Land Co.'s employees.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
1909.			
Oct. 9	Barnes and Wallace	0.86	148
16	....do	.91	141
25	A. Wallace	.90	137
30	Barnes and Wallace	1.02	167
Nov. 6	....do	.98	162
13	....do	1.02	181
27	....do	1.72	349
Dec. 4	....do	1.70	359
11	....do	1.90	467
1910.			
Feb. 23	Barnes and Sayles	1.80	421
June 25	Ricketts and Sayles	.90	185
July 1	....do	.90	166
9	....do	.87	158
10	....do	.87	154
25	Sayles and Jones	.73	148
30	Sayles and Sayles	.70	140
Aug. 20	W. D. Sayles	.65	125
30	....do	.63	129
Sept. 10	....do	.65	129
Oct. 1	....do	.63	129
Nov. 3	....do	.50	134
14	....do	.59	144
22	....do	.72	157
26	....do	1.00	212
Dec. 16	....do	1.10	229
30	....do	.79	154
1911.			
Jan. 17	W. D. Sayles	1.02	196
26	....do	2.20	602

Daily gage height, in feet, of Mill Creek near Los Molinos, Cal., for 1911.

[W. D. Sayles, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1												0.68
2										0.78	0.68	.....
3						2.70						.....
4					2.60				0.82	.80	.68	.....
5						2.60			.83			.....
6									.82	.75	.68	.73
7					2.30				.81	.74		.....
8												.70
9												.....
10						2.55		0.96	.78	.82		.....
11							1.65					.....
12						2.70						.....
13								.92		.73		.....
14											.75	.67
15										.72		.....
16												.....
17	1.02							.90			.78	.....
18												.....
19					2.25					.68	.74	.....
20						2.50			.74			.67
21			2.05							.69		.....
22					2.50							.....
23				2.30				.85	.75		.70	.....
24									.74	.70		.....
25								.84			.70	.....
26	2.20			2.60	2.35	2.00			.88	.72		.67
27												.....
28				2.25					.77	.70	.68	.74
29								.80				.....
30						1.96			.75			.....
31							1.10			.70		.....

NOTE.—The highest stage reached during 1911 was about 9 feet, and occurred about Mar. 8.

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Daily discharge, in second-feet, of Mill Creek near Los Molinos, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Nov.
1.	.....	.....	.....	.....	650	750	472	209	154	147	134	133
2.	.....	.....	.....	.....	650	850	462	206	155	149	133	135
3.	.....	.....	.....	.....	700	803	452	203	156	150	133	136
4.	.....	.....	.....	.....	753	778	442	200	156	152	133	137
5.	.....	.....	.....	.....	800	753	432	197	157	148	133	139
6.	.....	.....	.....	.....	700	748	422	194	156	144	133	141
7.	.....	.....	.....	.....	615	743	412	191	154	142	135	138
8.	.....	.....	.....	.....	600	738	402	188	153	146	137	136
9.	.....	.....	.....	.....	600	733	392	185	151	151	138	136
10.	.....	.....	.....	.....	600	729	383	182	149	156	139	135
11.	.....	.....	.....	.....	600	766	374	179	148	151	140	134
12.	.....	.....	.....	.....	600	803	365	177	147	146	141	133
13.	.....	.....	.....	.....	590	790	356	174	146	141	143	132
14.	.....	.....	.....	.....	580	778	348	173	146	140	144	132
15.	.....	.....	.....	.....	580	766	340	172	146	139	146	132
16.	.....	.....	.....	.....	580	754	332	171	146	138	147	132
17.	195	.....	.....	.....	580	742	324	170	145	136	149	132
18.	.....	.....	.....	.....	570	730	316	168	144	135	146	132
19.	.....	.....	.....	.....	594	718	308	166	143	133	142	132
20.	.....	.....	.....	.....	590	705	300	164	142	134	140	132
21.	.....	.....	514	.....	640	670	292	163	143	135	139	132
22.	.....	.....	.....	.....	705	635	284	162	144	135	138	132
23.	.....	.....	.....	615	750	600	276	161	144	136	136	132
24.	.....	.....	.....	.....	700	565	268	160	142	136	136	132
25.	.....	.....	.....	.....	660	530	260	159	154	138	136	132
26.	573	.....	.....	753	637	495	252	157	166	139	135	132
27.	.....	.....	.....	.....	610	492	244	156	156	138	134	137
28.	.....	.....	.....	594	590	488	236	154	147	136	133	142
29.	.....	.....	.....	.....	580	484	228	152	146	136	133	150
30.	.....	.....	.....	.....	580	481	220	152	144	136	133	155
31.	.....	.....	.....	.....	650	.....	213	153	.....	136	.....	160

NOTE.—Daily discharge determined from a fairly well-defined rating curve; discharge for days on which gage was not read—from May 1 to June 2 and Dec. 29 to 31—estimated from record of discharge of Feather River at Oroville; discharge interpolated June 4 to Dec. 27; estimated and interpolated figures roughly approximate.

Monthly discharge of Mill Creek near Los Molinos, Cal., for 1911.

[Drainage area, 173 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
May	800	570	633	3.66	4.22	38,900	C.
June	850	481	687	3.97	4.43	40,900	C.
July	472	213	336	1.94	2.24	20,700	C.
August	209	152	174	1.01	1.16	10,700	C.
September	166	142	149	.861	.96	8,870	C.
October	156	133	141	.815	.94	8,670	C.
November	149	133	138	.798	.89	8,210	C.
December	160	132	136	.786	.91	8,360	C.
The period	.....	.....	.....	.....	.....	145,000	

DEER CREEK NEAR VINA, CAL.

Location.—2½ miles northeast of the Roberts ranch house, in the NW. ¼ sec. 23, T. 25 N., R. 1 W., about 9½ miles northeast of Vina.

Records available.—October 17 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a sycamore tree on left bank, one-fourth mile above sheep bridge.

Channel.—Gravel and small bowlders, and appears permanent.

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Discharge measurements.—Made from car and cable 100 feet below gage or by wading.

Cooperation.—Maintained in cooperation with Ora Electric Co.

Discharge measurements of Deer Creek near Vina, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 24[a]	J. E. Stewart		156
Oct. 18[b]	G. T. Peekema	2.32	131
Dec. 7[c]	do	2.33	134

[a] Made by wading ¼ mile below location of gage installed Oct. 17.
[b] Made by wading ¼ mile below gage.
[c] Made by wading 5 feet below gage.

Daily gage height, in feet, of Deer Creek near Vina, Cal., for 1911.

[David Roberts, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	2.32	2.30	11	.....	2.45	2.30	21	2.32	2.32	2.30
2	.....	2.32	2.30	12	.....	2.35	2.30	22	2.32	.....	2.30
3	.....	2.30	2.30	13	.....	2.32	2.30	23	.....	2.30	2.27
4	.....	2.30	2.30	14	.....	2.35	2.30	24	.....	2.32	2.27
5	.....	2.30	2.30	15	.....	2.37	2.27	25	.....	.....	.....
6	.....	2.30	2.33	16	.....	2.55	2.27	26	.....	2.30	2.30
7	.....	2.30	2.33	17	2.32	2.40	2.33	27	.....	2.30	2.32
8	.....	2.30	2.30	18	2.32	2.35	2.32	28	.....	2.30	2.33
9	.....	2.32	2.30	19	.....	2.32	2.32	29	.....	2.27	2.32
10	.....	2.42	2.30	20	.....	2.32	2.32	30	.....	2.27	2.27
								31	2.32	.....	2.32

STONY CREEK AND TRIBUTARIES.

STONY CREEK NEAR FRUTO, CAL.

Location.—At Julian ranch, in the NE. ¼ sec. 14, T. 21 N., R. 6 W., 1¼ miles below mouth of Grindstone Creek and about 7 miles northwest of Fruto.

Records available.—January 30, 1901, to December 31, 1911.

Drainage area.—601 square miles.

Gage.—Vertical staff with inclined section for low water.

Channel.—Gravel which shifts at medium and high stages.

Discharge measurements.—Made from car and cable 100 feet below gage or by wading.

Storage.—The East Park reservoir, constructed by the United States Reclamation Service, stores water on Little Stony Creek for use on the Orland project.

Accuracy.—Results at high water are approximate. Otherwise the record is reliable.

Discharge measurements of Stony Creek near Fruto, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 20	J. E. Stewart	7.50	2,960
May 1	do	6.00	686
June 6	M. E. Ready	5.70	507
July 10	do	5.05	121
July 29[a]	do	4.95	126
Aug. 15[a]	do	5.03	124
Oct. 14[b]	J. E. Stewart	4.94	109

[a] Made by wading ¼ mile above Julian's ranch. [b] Made by wading 25 feet below the gage.

NOTE.—Measurements June 6 to Aug. 15 made by an engineer of the United States Reclamation Service.

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Daily gage height, in feet, of Stony Creek near Fruto, Cal., for 1911.

[Lee Julian, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.5	7.0	6.2	6.95	6.0	5.7	5.0	5.1	5.1	5.0	4.8	4.5
2	4.4	7.1	6.6	7.0	6.1	5.7	5.0	5.1	5.0	5.0	4.8	4.5
3	4.4	7.0	10.4	7.0	6.0	5.7	4.9	5.1	5.0	5.0	4.8	4.5
4	4.4	6.5	11.75	7.0	6.0	5.7	4.9	5.1	5.0	5.0	4.8	4.6
5	4.4	6.2	10.1	7.4	6.0	5.7	4.9	5.1	5.0	5.0	4.7	4.6
6	4.4	5.9	12.6	7.75	5.9	5.7	4.9	5.1	5.0	4.9	4.7	4.6
7	4.4	5.6	10.75	7.2	5.9	5.9	4.9	5.1	5.0	4.9	4.7	4.6
8	4.3	5.4	10.15	7.0	5.8	6.2	4.9	5.1	5.0	4.9	4.5	4.6
9	4.3	5.2	8.6	7.0	5.8	6.0	5.1	5.1	5.0	4.9	4.5	4.6
10	4.3	5.0	7.8	7.0	5.9	6.0	5.1	5.1	5.0	4.9	4.5	4.6
11	4.3	5.2	7.6	7.0	5.9	6.0	5.0	5.1	5.0	4.9	4.6	4.6
12	4.4	5.6	7.5	6.9	5.9	6.0	5.0	5.1	5.0	4.9	4.6	4.6
13	4.5	5.6	7.5	6.8	5.8	5.9	4.9	5.1	5.0	4.9	4.6	4.5
14	4.6	5.5	7.5	6.8	5.8	5.9	4.9	5.1	5.0	4.95	4.6	4.5
15	5.0	5.3	7.65	6.8	5.8	5.8	4.9	5.1	5.0	4.95	4.6	4.5
16	5.0	5.2	7.6	6.7	5.8	5.8	5.0	5.1	5.0	4.9	4.6	4.5
17	5.0	5.2	7.45	6.5	5.8	5.7	5.0	5.1	5.0	4.9	4.7	4.6
18	5.5	5.2	7.5	6.4	5.8	5.6	5.0	5.1	5.0	4.9	4.6	4.6
19	7.25	5.2	7.55	6.3	5.8	5.6	5.0	5.1	5.0	4.9	4.6	4.6
20	7.75	5.2	7.6	6.3	5.8	5.5	5.0	5.1	5.0	4.85	4.6	4.6
21	6.5	5.1	7.8	6.3	5.7	5.5	5.0	5.1	5.0	4.85	4.6	4.6
22	6.0	5.1	7.75	6.3	5.7	5.4	5.0	5.1	5.0	4.8	4.6	4.5
23	6.0	5.1	8.0	6.1	5.7	5.4	5.0	5.1	5.0	4.8	4.6	4.5
24	6.4	5.1	8.0	6.0	5.7	5.4	5.0	5.1	5.0	4.8	4.6	4.5
25	6.2	5.0	8.0	5.9	5.7	5.3	5.0	5.1	5.0	4.8	4.6	4.5
26	6.3	5.0	7.75	6.0	5.7	5.3	5.0	5.1	5.0	4.8	4.6	4.5
27	6.5	5.0	7.3	6.2	5.8	5.3	5.0	5.1	5.0	4.8	4.6	4.5
28	7.25	5.45	7.1	6.1	5.8	5.2	5.0	5.1	5.0	4.8	4.5	4.6
29	7.9	.....	6.65	6.0	5.8	5.2	5.0	5.1	5.0	4.8	4.5	4.6
30	7.2	.....	6.95	6.0	5.7	5.1	5.0	5.1	5.0	4.8	4.5	4.6
31	7.35	.....	7.1	.....	5.7	.....	5.0	5.1	.....	4.8	.....	4.6

Daily discharge, in second-feet, of Stony Creek near Fruto, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	118	2,210	1,220	1,650	690	465	125	161	161	125	68	15
2	93	2,340	1,710	1,710	770	465	125	161	125	125	68	15
3	93	2,210	8,760	1,710	690	465	95	161	125	125	68	15
4	93	1,580	12,500	1,710	690	465	95	161	125	125	68	27
5	93	1,220	8,040	2,250	690	465	95	161	125	125	45	27
6	93	940	15,400	2,790	610	465	95	161	125	95	45	27
7	93	695	9,620	1,960	610	610	95	161	125	95	45	27
8	72	550	8,020	1,710	535	860	95	161	125	95	15	27
9	72	425	4,330	1,710	535	690	161	161	125	95	15	27
10	72	315	2,870	1,710	610	690	161	161	125	95	15	27
11	72	425	2,550	1,710	610	690	125	161	125	95	27	27
12	93	695	2,400	1,590	610	690	125	161	125	95	27	27
13	118	695	2,400	1,480	535	610	95	161	125	95	27	15
14	145	620	2,400	1,480	535	610	95	161	125	110	27	15
15	315	485	2,630	1,480	535	535	95	161	125	110	27	15
16	315	425	2,550	1,370	535	535	125	161	125	95	27	15
17	315	425	2,320	1,150	535	465	125	161	125	95	45	27
18	620	425	2,400	1,050	535	405	125	161	125	95	27	27
19	2,560	425	2,480	950	535	405	125	161	125	95	27	27
20	3,360	425	2,550	950	535	350	125	161	125	82	27	27
21	1,580	370	2,870	950	465	350	125	161	125	82	27	27
22	1,030	370	2,790	950	465	300	125	161	125	68	27	15
23	1,030	370	3,200	770	465	300	125	161	125	68	27	15
24	1,460	370	3,200	690	465	300	125	161	125	68	27	15
25	1,220	315	3,200	610	465	250	125	161	125	68	27	15
26	1,340	315	2,790	690	465	250	125	161	125	68	27	15
27	1,560	315	2,100	860	535	250	125	161	125	68	27	15
28	2,560	585	1,880	770	535	203	125	161	125	68	15	27
29	3,610	.....	1,320	690	535	203	125	161	125	68	15	27
30	2,490	.....	1,650	690	465	161	125	161	125	68	15	27
31	2,720	.....	1,830	.....	465	.....	125	161	.....	68	.....	27

NOTE.—Daily discharge determined from two rating curves fairly well defined except at extreme high and extreme low stages. The change in rating was made Mar. 7.

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Monthly discharge of Stony Creek near Fruto, Cal., for 1911.

[Drainage area, 601 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	3,610	72	949	1.58	1.82	58,400	C.
February	2,340	315	734	1.22	1.27	40,800	C.
March	15,400	1,220	4,000	6.66	7.68	246,000	C.
April	2,790	610	1,330	2.21	2.47	79,100	B.
May	770	465	557	.927	1.07	34,200	B.
June	860	161	450	.749	.84	26,800	B.
July	161	95	119	.198	.23	7,320	B.
August	161	161	161	.268	.31	9,900	B.
September	161	125	126	.210	.23	7,500	B.
October	125	68	91.2	.152	.18	5,610	B.
November	68	15	32.5	.054	.06	1,930	C.
December	27	15	22.0	.037	.04	1,350	C.
The year	15,400	15	716	1.19	16.20	519,000	

LITTLE STONY CREEK NEAR LODOGA, CAL.

Location.—At East Park reservoir, 4 miles above junction with Stony Creek and 3½ miles northwest of Lodoga.

Records available.—January 1, 1908, to December 31, 1911.

Drainage area.—102 square miles.

Gage.—Previous to December 1, 1910, the station was maintained a short distance below the present site. Several gages with independent datums were used. Beginning with December 1, 1910, the record is from the gage at the dam.

Discharge.—Computed from gage heights observed at the dam. Correction has been made for evaporation, which is determined from records obtained from an evaporation pan at the reservoir.

Accuracy.—Considerable care is used in collecting these data and results should be good.

Cooperation.—Record furnished by United States Reclamation Service through A. N. Burch, acting project engineer.

Daily gage height, in feet, of East Park reservoir near Lodoga, Cal., for 1911.

[J. Lea, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	20.4	56.4	67.1	75.6	80.6	82.3	82.6	79.2	73.6	67.8	63.1	62.5
2	20.5	58.0	67.4	75.9	80.7	82.4	82.6	79.0	73.5	67.6	63.0	62.5
3	20.6	59.1	68.5	76.1	80.8	82.4	82.6	78.8	73.3	67.4	62.9	62.5
4	20.7	60.0	72.4	76.3	80.9	82.4	82.6	78.7	73.1	67.2	62.8	62.6
5	20.8	60.8	76.3	76.6	81.0	82.5	82.5	78.5	72.9	67.0	62.7	62.6
6	20.9	61.3	80.2	77.0	81.0	82.5	82.5	78.3	72.7	66.8	62.7	62.6
7	21.0	61.8	85.8	77.4	81.1	82.5	82.5	78.1	72.5	66.6	62.6	62.6
8	21.1	62.2	85.9	77.7	81.2	82.6	82.4	78.0	72.3	66.4	62.6	62.6
9	21.2	62.5	85.2	77.9	81.3	82.6	82.3	77.8	72.1	66.3	62.6	62.6
10	21.3	62.7	84.9	78.1	81.3	82.6	82.2	77.6	71.9	66.0	62.6	62.6
11	21.6	63.5	84.5	78.3	81.4	82.6	82.1	77.5	71.7	65.9	62.6	62.6
12	23.5	63.7	83.9	78.5	81.4	82.7	82.0	77.3	71.5	65.8	62.6	62.6
13	24.3	64.2	83.4	78.7	81.5	82.7	81.9	77.1	71.3	65.6	62.6	62.6
14	24.9	64.5	83.3	78.8	81.6	82.7	81.8	76.9	71.1	65.4	62.6	62.6
15	25.6	64.8	82.9	78.9	81.6	82.7	81.7	76.8	70.9	65.3	62.5	62.6

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Daily gage height, in feet, of East Park reservoir near Lodoga, Cal., for 1911—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	26.2	65.1	82.4	79.1	81.6	82.7	81.6	76.6	70.7	65.1	62.5	62.6
17	26.5	65.3	81.9	79.2	81.7	82.7	81.5	76.4	70.5	64.9	62.5	62.6
18	27.1	65.5	81.4	79.3	81.7	82.7	81.3	76.2	70.3	64.7	62.5	62.6
19	28.4	65.7	80.7	79.4	81.8	82.7	81.2	76.0	70.1	64.6	62.5	62.6
20	36.0	65.9	79.8	79.5	81.8	82.7	81.0	75.8	69.9	64.4	62.5	62.6
21	37.7	66.0	79.0	79.6	81.9	82.7	80.9	75.7	69.7	64.3	62.5	62.6
22	38.1	66.1	78.3	79.7	81.9	82.7	80.7	75.5	69.5	64.2	62.5	62.6
23	38.4	66.3	77.6	79.8	82.0	82.7	80.6	75.3	69.3	64.0	62.5	62.6
24	38.9	66.4	76.9	79.9	82.0	82.7	80.4	75.1	69.1	63.9	62.5	62.6
25	40.0	66.5	76.1	80.0	82.1	82.6	80.3	74.9	68.9	63.8	62.5	62.6
26	41.0	66.6	75.2	80.1	82.1	82.6	80.1	74.7	68.7	63.7	62.5	62.6
27	41.8	66.7	74.9	80.2	82.2	82.6	80.0	74.5	68.6	63.6	62.5	62.6
28	45.6	66.9	74.9	80.3	82.2	82.6	79.8	74.3	68.4	63.5	62.5	62.7
29	50.3	.....	75.0	80.4	82.2	82.6	79.7	74.2	68.2	63.4	62.5	62.7
30	53.4	.....	75.2	80.5	82.3	82.6	79.5	74.0	68.0	63.3	62.5	62.7
31	55.3	.....	75.4	.....	82.3	.....	79.4	73.8	.....	63.2	.....	62.7

Daily discharge, in second-feet, of Little Stony Creek near Lodoga, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3	396	100	106	80	44	18	16	11	7	2	6
2	3	599	150	217	78	46	20	16	10	7	2	6
3	4	421	575	136	78	48	18	16	10	7	2	6
4	3	351	2,220	136	78	48	18	17	10	7	2	7
5	3	362	2,580	224	90	49	18	17	11	7	2	7
6	3	237	2,820	290	40	44	18	14	11	7	2	7
7	3	227	4,980	282	40	47	18	16	11	7	2	7
8	2	186	2,450	217	78	44	16	16	11	7	3	7
9	3	141	1,450	144	78	46	16	16	11	7	3	7
10	3	91	1,250	152	40	44	18	14	11	7	3	7
11	8	378	935	144	40	44	18	16	10	7	3	7
12	57	101	800	146	46	44	17	16	11	7	3	7
13	31	232	760	152	46	15	15	16	11	7	3	7
14	30	146	700	71	78	17	17	16	10	7	3	7
15	34	141	675	68	31	17	17	16	11	7	3	7
16	30	146	600	152	31	20	19	16	11	7	3	7
17	30	96	600	76	32	20	16	16	11	5	3	7
18	32	101	600	73	40	20	14	15	11	5	3	6
19	80	96	575	88	40	20	17	17	11	5	3	6
20	709	93	545	83	40	20	17	15	11	5	3	6
21	230	50	525	88	40	17	17	15	9	5	3	6
22	59	50	550	83	46	17	17	11	9	5	3	6
23	43	101	500	88	46	20	17	11	9	5	3	6
24	71	50	500	75	40	20	17	11	9	2	3	6
25	164	50	425	68	40	20	14	9	9	2	3	6
26	181	50	400	78	40	13	16	11	9	2	3	6
27	146	50	375	90	40	11	16	11	9	2	3	6
28	760	101	300	75	31	11	16	10	8	2	3	6
29	1,140	.....	235	73	31	18	16	10	7	2	3	6
30	907	.....	200	83	32	18	14	11	7	2	3	6
31	637	.....	150	.....	31	.....	14	11	.....	2	.....	6

NOTE.—Daily discharge based on the water-surface elevation of East Park reservoir, the daily accumulation, and the evaporation loss. On account of the extreme water-tightness of the storage basin, seepage losses were assumed to be negligible.

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LITTLE COW CREEK AT PALO CEDRO, CAL.

Location.—At highway bridge, in sec. 5, T. 31 N., R. 3 W., one-fourth mile east of Palo Cedro and one-fourth mile above junction with Cow Creek.

Records available.—August 9 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on bridge pier near right bank.

Channel.—Gravel and small bowlders; may shift slightly at high stages.

Discharge measurements.—From bridge, except at low stages, when measurements are made by wading above the gage.

Diversions.—A small amount of water is pumped from this stream for irrigation. The Terry Lumber Co.'s flume, which is supplied by a diversion from Montgomery Creek, discharges into this stream. From June to December this amounts to 8 or 10 second-feet. For the remainder of the year this is reduced to about 6 second-feet.

The following discharge measurement was made by J. E. Stewart by wading 600 feet above the gage:

August 9, 1911: Gage height, 1.62 feet; discharge, 8.7 second-feet.

Daily gage height, in feet, of Little Cow Creek at Palo Cedro, Cal., for 1911.

[Richard Logan, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.5	1.7	1.9	1.9	16	1.6	1.6	1.8	2.1	1.95
2	.....	1.6	1.75	1.85	1.95	17	1.6	1.6	1.8	2.1	1.95
3	.....	1.5	1.8	1.9	1.95	18	1.6	1.55	1.8	2.0	1.9
4	.....	1.5	1.8	1.9	1.95	19	1.6	1.55	1.8	1.95	2.0
5	.....	1.55	1.8	1.85	1.95	20	1.6	1.5	1.8	1.9	2.0
6	.....	1.55	1.8	1.9	1.9	21	1.5	1.6	1.8	1.9	2.0
7	.....	1.55	1.75	1.9	2.0	22	1.65	1.65	1.8	1.95	2.0
8	.....	1.6	1.75	1.9	1.9	23	1.55	1.6	1.8	1.95	2.0
9	1.6	1.6	1.8	1.9	1.95	24	1.6	1.6	1.8	1.9	2.0
10	1.65	1.65	1.85	1.9	1.95	25	1.6	1.7	1.9	1.9	1.9
11	1.6	1.65	1.85	1.95	1.9	26	1.55	1.75	1.85	1.9	1.9
12	1.5	1.6	1.85	1.95	1.9	27	1.55	1.8	1.8	1.95	1.9
13	1.58	1.65	1.85	1.95	1.9	28	1.6	1.75	1.8	1.95	1.9
14	1.48	1.65	1.85	1.95	1.9	29	1.6	1.75	1.85	1.9	2.0
15	1.5	1.6	1.8	2.0	1.9	30	1.6	1.65	1.9	1.95	2.0
						31	1.55	.....	1.9	.....	2.0

BEAR CREEK NEAR MILLVILLE, CAL.

Location.—At highway bridge, in sec. 36, T. 31 N., R. 3 W., 4 miles southeast of Millville and 5 miles above junction with Sacramento River.

Records available.—August 19 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on upstream side of bridge pier near left bank.

Channel.—Small bowlders; rough.

Discharge measurements.—Made by wading about 50 feet above the gage, except at high stages, when measurements are made from the bridge.

The following discharge measurement was made by J. E. Stewart:

August 19, 1911: Gage height, 0.67 foot; discharge, 33 second-feet.

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Daily gage height, in feet, of Bear Creek near Millville, Cal., for 1911.

[C. L. Lack and Fred Dersch, observers.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	0.68	0.85	1.00	1.80	16	.....	0.78	0.92	1.80	1.75
2	.....	.68	.85	1.00	1.80	17	.....	.78	.92	1.80	1.80
3	.....	.68	.85	1.00	1.80	18	.....	.78	.92	1.80	1.75
4	.....	.70	.85	1.00	1.80	19	0.68	.78	.92	1.80	1.75
5	.....	.70	.88	1.10	1.80	20	.68	.78	.92	1.80	1.75
6	.....	.70	.88	1.00	1.80	21	.68	.78	.92	1.80	1.75
7	.....	.70	.88	1.00	1.80	22	.68	.78	.95	1.80	1.70
8	.....	.70	.88	1.00	1.80	23	.68	.78	.95	1.80	1.70
9	.....	.70	1.38	1.00	1.80	24	.68	.78	.98	1.80	1.65
10	.....	.75	1.40	1.75	1.80	25	.68	.80	1.00	1.80	1.65
11	.....	.75	.98	1.75	1.80	26	.68	.88	1.00	1.80	1.65
12	.....	.75	.98	1.75	1.80	27	.68	.88	1.00	1.80	1.65
13	.....	.78	.98	1.75	1.75	28	.68	.85	1.00	1.80	1.65
14	.....	.78	.98	1.75	1.75	29	.68	.85	1.00	1.80	1.65
15	.....	.78	.98	1.75	1.75	30	.68	.85	1.00	1.80	1.65
						31	.68	.....	1.00	.....	1.65

NOTE.—Rise in gage height Nov. 10 caused by a loose rock dam which was placed across the creek 40 feet below the gage to protect bridge piers.

NORTH FORK OF COTTONWOOD CREEK AT ONO, CAL.

Location.—At the highway bridge near the center of sec. 11, T. 30 N., R. 7 W., one-fourth mile southwest of Ono. Byron Creek enters just above and Eagle Creek one-half mile below the station.

Records available.—October 27, 1907, to December 31, 1911.

Drainage area.—52 square miles.

Gage.—Vertical staff on left face of middle pier of bridge.

Channel.—Gravel and small bowlders and subject to slight change at high stages. Current at angle to bridge in right channel.

Discharge measurements.—Made from downstream side of bridge, except at low water when wading measurements are made about 100 feet below the gage.

Diversions.—Several small ditches divert water from this stream above the station. In September, 1908, these diversions amounted to 14 second-feet.

Accuracy.—Results are good.

Discharge measurements of North Fork of Cottonwood Creek at Ono, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 8[a]	H. D. McGlashan	6.30	813
Oct. 11[b]	J. E. Stewart	4.36	11

[a] Conditions good except for right channel. Gage difficult to read accurately at this stage owing to roughness of water surface.

[b] Made by wading about 50 feet below gage.

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Daily gage height, in feet, of North Fork of Cottonwood Creek at Ono, Cal., for 1911.

[F. J. Wheelock, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.70	5.70	5.20	5.65	5.45	5.10	4.75	4.32	4.25	4.38	4.50	4.45
2	4.65	5.70	5.20	5.65	5.45	5.05	4.68	4.30	4.22	4.40	4.45	4.40
3	4.60	5.70	5.50	5.65	5.42	5.05	4.62	4.30	4.28	4.40	4.42	4.40
4	4.62	5.68	6.50	5.72	5.40	5.02	4.65	4.28	4.20	4.40	4.40	4.40
5	4.65	5.62	6.85	5.55	5.40	5.00	4.58	4.25	4.20	4.35	4.40	4.45
6	4.65	5.52	7.75	5.95	5.35	5.00	4.58	4.25	4.22	4.38	4.40	4.78
7	4.65	5.42	6.90	5.85	5.35	5.02	4.58	4.25	4.25	4.35	4.38	4.55
8	4.65	5.40	6.30	5.85	5.35	5.00	4.52	4.25	4.20	4.38	4.40	4.50
9	4.65	5.30	5.95	5.80	5.32	5.00	4.52	4.25	4.22	4.40	4.40	4.45
10	4.60	5.55	5.90	5.80	5.30	5.00	4.52	4.25	4.28	4.35	4.40	4.45
11	4.85	5.58	5.80	5.75	5.30	4.92	4.51	4.25	4.30	4.35	4.40	4.45
12	4.72	5.85	5.80	5.70	5.28	4.92	4.51	4.25	4.30	4.35	4.40	4.45
13	4.78	5.70	5.75	5.65	5.25	4.88	4.51	4.25	4.30	4.35	4.40	4.45
14	4.85	5.50	5.75	5.60	5.25	4.88	4.51	4.25	4.30	4.40	4.40	4.45
15	4.85	5.48	5.70	5.60	5.25	4.88	4.49	4.25	4.30	4.40	4.60	4.45
16	4.80	5.42	5.70	5.55	5.30	4.85	4.49	4.25	4.25	4.50	4.60	4.50
17	4.80	5.38	5.70	5.55	5.35	4.82	4.46	4.25	4.25	4.50	4.50	4.48
18	4.85	5.32	5.70	5.55	5.35	4.82	4.50	4.25	4.25	4.50	4.48	4.45
19	6.75	5.30	5.70	5.52	5.30	4.82	4.45	4.25	4.25	4.45	4.45	4.45
20	5.80	5.30	5.70	5.50	5.30	4.78	4.45	4.25	4.25	4.45	4.45	4.45
21	5.35	5.30	5.70	5.50	5.25	4.78	4.45	4.25	4.25	4.45	4.45	4.45
22	5.20	5.28	5.70	5.50	5.25	4.78	4.45	4.25	4.25	4.45	4.45	4.45
23	5.12	5.25	5.70	5.50	5.25	4.78	4.45	4.22	4.25	4.45	4.45	4.45
24	5.15	5.25	5.70	5.50	5.22	4.78	4.45	4.20	4.25	4.45	4.45	4.45
25	5.15	5.22	5.70	5.50	5.20	4.78	4.45	4.20	4.35	4.48	4.45	4.45
26	5.15	5.20	5.65	5.52	5.20	4.75	4.40	4.20	4.45	4.50	4.45	4.45
27	5.5	5.20	5.65	5.50	5.20	4.72	4.35	4.20	4.40	4.50	4.45	4.52
28	5.95	5.20	5.65	5.50	5.15	4.72	4.35	4.20	4.38	4.50	4.45	4.60
29	5.85	.....	5.65	5.45	5.12	4.72	4.35	4.20	4.35	4.50	4.45	4.60
30	5.80	.....	5.65	5.45	5.10	4.78	4.35	4.20	4.35	4.50	4.45	4.60
31	5.80	.....	5.65	.....	5.10	.....	4.35	4.25	.....	4.50	.....	4.60

Daily discharge, in second-feet, of North Fork of Cottonwood Creek at Ono, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	36	349	143	324	231	115	43	8.8	6.5	11	17	14
2	30	349	143	324	231	102	34	8.0	5.6	12	14	12
3	25	349	252	324	219	102	27	8.0	7.4	12	13	12
4	27	339	950	360	211	95	30	7.4	5.0	12	12	12
5	30	308	1,320	275	211	90	23	6.5	5.0	10	12	14
6	30	261	2,460	501	193	90	23	6.5	5.6	11	12	47
7	30	219	1,380	436	193	95	23	6.5	6.5	10	11	21
8	30	211	770	436	193	90	19	6.5	5.0	11	12	17
9	30	175	501	405	182	90	19	6.5	5.6	12	12	14
10	25	275	467	405	175	90	19	6.5	7.4	10	12	14
11	58	289	405	377	175	72	18	6.5	8.0	10	12	14
12	39	436	405	349	169	72	18	6.5	8.0	10	12	14
13	47	349	377	324	159	64	18	6.5	8.0	10	12	14
14	58	252	377	298	159	64	18	6.5	8.0	12	12	14
15	58	244	349	298	159	64	16	6.5	8.0	12	25	14
16	50	219	349	275	175	59	16	6.5	6.5	17	25	17
17	50	204	349	275	193	54	15	6.5	6.5	17	17	16
18	58	182	349	275	193	54	17	6.5	6.5	17	16	14
19	1,220	175	349	261	175	54	14	6.5	6.5	14	14	14
20	405	175	349	252	175	47	14	6.5	6.5	14	14	14
21	193	175	349	252	159	47	14	6.5	6.5	14	14	14
22	143	169	349	252	159	47	14	6.5	6.5	14	14	14
23	121	159	349	252	159	47	14	5.6	6.5	14	14	14
24	129	159	349	252	149	47	14	5.0	6.5	14	14	14
25	129	149	349	252	143	47	14	5.0	10	16	14	14
26	129	143	324	261	143	43	12	5.0	14	17	14	14
27	252	143	324	252	143	39	10	5.0	12	17	14	19
28	501	143	324	252	129	39	10	5.0	11	17	14	25
29	436	.....	324	231	120	39	10	5.0	10	17	14	25
30	405	.....	324	231	115	47	10	5.0	10	17	14	25
31	405	.....	324	.....	115	.....	10	6.5	.....	17	.....	25

NOTE.—Daily discharge determined from a rating curve well defined below 1,500 second-feet.

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Monthly discharge of North Fork of Cottonwood Creek at Ono, Cal., for 1911.

[Drainage area, 52 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	1,220	25	167	3.21	3.70	10,300	A.
February	349	143	236	4.54	4.73	13,100	A.
March	2,460	143	508	9.77	11.26	31,200	A.
April	501	231	309	5.94	6.63	18,400	A.
May	231	115	171	3.29	3.79	10,500	A.
June	115	39	66.7	1.28	1.43	3,970	A.
July	43	10	17.9	.344	.40	1,100	B.
August	8.8	5	6.33	.122	.14	389	C.
September	14	5	7.50	.144	.16	446	C.
October	17	10	13.5	.260	.30	830	B.
November	25	11	14.2	.273	.30	845	B.
December	47	12	16.9	.325	.37	1,040	B.
The year	2,460	5	127	2.44	33.21	92,100	

MILL CREEK NEAR LOS MOLINOS, CAL.

Location.—At suspension footbridge one-fourth mile above Los Molinos Land Co.'s diversion dam, in NE. ¼ sec. 1, T. 25 N., R. 2 W., 4½ miles northeast of Los Molinos, and 5 miles east of Tehama.

Records available.—August 9, 1909 to December 31, 1911.

Drainage area.—173 square miles.

Gage.—Inclined staff on right bank at footbridge.

Channel.—Cemented gravel and small bowlders and permanent.

Discharge measurements.—Made from suspension footbridge at gage and by wading at low stages.

Accuracy.—At medium and high stages the current is very swift. Rating curve is only fairly well defined as measurements are somewhat scattering. Results are believed to be reliable.

Cooperation.—Gage-height record and occasional measurements furnished by the Los Molinos Land Co.

Discharge measurements of Mill Creek near Los Molinos, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 23[a]	J. E. Stewart	0.85	170
Oct. 10[a]	.....do	.82	157
Oct. 19[a]	G. T. Peekema	.69	123
Dec. 8[a]	.....do	.69	124

[a] Made by wading at footbridge.

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Discharge measurements of Mill Creek near Los Molinos, Cal., in 1909–1911, made by Los Molinos Land Co.'s employees.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
1909.			
Oct. 9	Barnes and Wallace	0.86	148
16	....do	.91	141
25	A. Wallace	.90	137
30	Barnes and Wallace	1.02	167
Nov. 6	....do	.98	162
13	....do	1.02	181
27	....do	1.72	349
Dec. 4	....do	1.70	359
11	....do	1.90	467
1910.			
Feb. 23	Barnes and Sayles	1.80	421
June 25	Ricketts and Sayles	.90	185
July 1	....do	.90	166
9	....do	.87	158
10	....do	.87	154
25	Sayles and Jones	.73	148
30	Sayles and Sayles	.70	140
Aug. 20	W. D. Sayles	.65	125
30	....do	.63	129
Sept. 10	....do	.65	129
Oct. 1	....do	.63	129
Nov. 3	....do	.50	134
14	....do	.59	144
22	....do	.72	157
26	....do	1.00	212
Dec. 16	....do	1.10	229
30	....do	.79	154
1911.			
Jan. 17	W. D. Sayles	1.02	196
26	....do	2.20	602

Daily gage height, in feet, of Mill Creek near Los Molinos, Cal., for 1911.

[W. D. Sayles, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.68
2.	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.78	0.68	.....
3.	.....	.....	.....	.....	.....	2.70	.....	.....	.....	.....	.....	.....
4.	.....	.....	.....	.....	2.60	.....	.....	.....	0.82	.80	.68	.....
5.	.....	.....	.....	.....	.....	2.60	.....	.....	.83	.....	.....	.....
6.	.....	.....	.....	.....	.....	.....	.....	.....	.82	.75	.68	.73
7.	.....	.....	.....	.....	2.30	.....	.....	.....	.81	.74	.....	.....
8.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.70
9.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10.	.....	.....	.....	.....	.....	2.55	.....	0.96	.78	.82	.....	.....
11.	.....	.....	.....	.....	.....	.....	1.65	.....	.....	.....	.....	.....
12.	.....	.....	.....	.....	.....	2.70	.....	.....	.....	.....	.....	.....
13.	.....	.....	.....	.....	.....	.....	.....	.92	.....	.73	.....	.....
14.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.75	.67
15.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.72	.....	.....
16.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
17.	1.02	.....	.....	.....	.....	.....	.....	.90	.....	.....	.78	.....
18.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
19.	.....	.....	.....	.....	2.25	.....	.....	.....	.....	.68	.74	.....
20.	.....	.....	.....	.....	.....	2.50	.....	.....	.74	.....	.....	.67
21.	.....	.....	2.05	.....	.....	.....	.....	.....	.....	.69	.....	.....
22.	.....	.....	.....	.....	2.50	.....	.....	.....	.....	.....	.....	.....
23.	.....	.....	.....	2.30	.....	.....	.....	.85	.75	.....	.70	.....
24.	.....	.....	.....	.....	.....	.....	.....	.....	.74	.70	.....	.....
25.	.....	.....	.....	.....	.....	.....	.....	.84	.....	.....	.70	.....
26.	2.20	.....	.....	2.60	2.35	2.00	.....	.....	.88	.72	.....	.67
27.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
28.	.....	.....	.....	2.25	.....	.....	.....	.....	.77	.70	.68	.74
29.	.....	.....	.....	.....	.....	.....	.....	.80	.....	.....	.....	.....
30.	.....	.....	.....	.....	.....	1.96	.....	.....	.75	.....	.....	.....
31.	.....	.....	.....	.....	.....	.....	1.10	.....	.....	.70	.....	.....

NOTE.—The highest stage reached during 1911 was about 9 feet, and occurred about Mar. 8.

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Daily discharge, in second-feet, of Mill Creek near Los Molinos, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Nov.
1.					650	750	472	209	154	147	134	133
2.					650	850	462	206	155	149	133	135
3.					700	803	452	203	156	150	133	136
4.					753	778	442	200	156	152	133	137
5.					800	753	432	197	157	148	133	139
6.					700	748	422	194	156	144	133	141
7.					615	743	412	191	154	142	135	138
8.					600	738	402	188	153	146	137	136
9.					600	733	392	185	151	151	138	136
10.					600	729	383	182	149	156	139	135
11.					600	766	374	179	148	151	140	134
12.					600	803	365	177	147	146	141	133
13.					580	790	356	174	146	141	143	132
14.					580	778	348	173	146	140	144	132
15.					580	766	340	172	146	139	146	132
16.					580	754	332	171	146	138	147	132
17.	195				580	742	324	170	145	136	149	132
18.					570	730	316	168	144	135	146	132
19.					594	718	308	166	143	133	142	132
20.					590	705	300	164	142	134	140	132
21.				514	640	670	292	163	143	135	139	132
22.					705	635	284	162	144	135	138	132
23.					750	600	276	161	144	136	136	132
24.					700	565	268	160	142	136	136	132
25.					660	530	260	159	154	138	136	132
26.	573			753	637	495	252	157	166	139	135	132
27.					610	492	244	156	156	138	134	137
28.				594	590	488	236	154	147	136	133	142
29.					580	484	228	152	146	136	133	150
30.					580	481	220	152	144	136	133	155
31.					650	.....	213	153	.....	136	.....	160

NOTE.—Daily discharge determined from a fairly well-defined rating curve; discharge for days on which gage was not read—from May 1 to June 2 and Dec. 29 to 31—estimated from record of discharge of Feather River at Oroville; discharge interpolated June 4 to Dec. 27; estimated and interpolated figures roughly approximate.

Monthly discharge of Mill Creek near Los Molinos, Cal., for 1911.

[Drainage area, 173 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
May	800	570	633	3.66	4.22	38,900	C.
June	850	481	687	3.97	4.43	40,900	C.
July	472	213	336	1.94	2.24	20,700	C.
August	209	152	174	1.01	1.16	10,700	C.
September	166	142	149	.861	.96	8,870	C.
October	156	133	141	.815	.94	8,670	C.
November	149	133	138	.798	.89	8,210	C.
December	160	132	136	.786	.91	8,360	C.
The period						145,000	

DEER CREEK NEAR VINA, CAL.

Location.—2½ miles northeast of the Roberts ranch house, in the NW. ¼ sec. 23, T. 25 N., R. 1 W., about 9½ miles northeast of Vina.

Records available.—October 17 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a sycamore tree on left bank, one-fourth mile above sheep bridge.

Channel.—Gravel and small bowlders, and appears permanent.

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Discharge measurements.—Made from car and cable 100 feet below gage or by wading.

Cooperation.—Maintained in cooperation with Ora Electric Co.

Discharge measurements of Deer Creek near Vina, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 24[a]	J. E. Stewart		156
Oct. 18[b]	G. T. Peekema	2.32	131
Dec. 7[c]	do	2.33	134

[a] Made by wading ¼ mile below location of gage installed Oct. 17.
[b] Made by wading ¼ mile below gage.
[c] Made by wading 5 feet below gage.

Daily gage height, in feet, of Deer Creek near Vina, Cal., for 1911.

[David Roberts, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	2.32	2.30	11	.....	2.45	2.30	21	2.32	2.32	2.30
2	.....	2.32	2.30	12	.....	2.35	2.30	22	2.32	.....	2.30
3	.....	2.30	2.30	13	.....	2.32	2.30	23	.....	2.30	2.27
4	.....	2.30	2.30	14	.....	2.35	2.30	24	.....	2.32	2.27
5	.....	2.30	2.30	15	.....	2.37	2.27	25	.....	.....	.....
6	.....	2.30	2.33	16	.....	2.55	2.27	26	.....	2.30	2.30
7	.....	2.30	2.33	17	2.32	2.40	2.33	27	.....	2.30	2.32
8	.....	2.30	2.30	18	2.32	2.35	2.32	28	.....	2.30	2.33
9	.....	2.32	2.30	19	.....	2.32	2.32	29	.....	2.27	2.32
10	.....	2.42	2.30	20	.....	2.32	2.32	30	.....	2.27	2.27
								31	2.32	.....	2.32

STONY CREEK AND TRIBUTARIES.

STONY CREEK NEAR FRUTO, CAL.

Location.—At Julian ranch, in the NE. ¼ sec. 14, T. 21 N., R. 6 W., 1¼ miles below mouth of Grindstone Creek and about 7 miles northwest of Fruto.

Records available.—January 30, 1901, to December 31, 1911.

Drainage area.—601 square miles.

Gage.—Vertical staff with inclined section for low water.

Channel.—Gravel which shifts at medium and high stages.

Discharge measurements.—Made from car and cable 100 feet below gage or by wading.

Storage.—The East Park reservoir, constructed by the United States Reclamation Service, stores water on Little Stony Creek for use on the Orland project.

Accuracy.—Results at high water are approximate. Otherwise the record is reliable.

Discharge measurements of Stony Creek near Fruto, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 20	J. E. Stewart	7.50	2,960
May 1	do	6.00	696
June 6	M. E. Ready	5.70	507
July 10	do	5.05	121
July 29[a]	do	4.95	126
Aug. 15[a]	do	5.03	124
Oct. 14[b]	J. E. Stewart	4.94	109

[a] Made by wading ¼ mile above Julian's ranch. [b] Made by wading 25 feet below the gage.

NOTE.—Measurements June 6 to Aug. 15 made by an engineer of the United States Reclamation Service.

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Daily gage height, in feet, of Stony Creek near Fruto, Cal., for 1911.

[Lee Julian, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.5	7.0	6.2	6.95	6.0	5.7	5.0	5.1	5.1	5.0	4.8	4.5
2	4.4	7.1	6.6	7.0	6.1	5.7	5.0	5.1	5.0	5.0	4.8	4.5
3	4.4	7.0	10.4	7.0	6.0	5.7	4.9	5.1	5.0	5.0	4.8	4.5
4	4.4	6.5	11.75	7.0	6.0	5.7	4.9	5.1	5.0	5.0	4.8	4.6
5	4.4	6.2	10.1	7.4	6.0	5.7	4.9	5.1	5.0	5.0	4.7	4.6
6	4.4	5.9	12.6	7.75	5.9	5.7	4.9	5.1	5.0	4.9	4.7	4.6
7	4.4	5.6	10.75	7.2	5.9	5.9	4.9	5.1	5.0	4.9	4.7	4.6
8	4.3	5.4	10.15	7.0	5.8	6.2	4.9	5.1	5.0	4.9	4.5	4.6
9	4.3	5.2	8.6	7.0	5.8	6.0	5.1	5.1	5.0	4.9	4.5	4.6
10	4.3	5.0	7.8	7.0	5.9	6.0	5.1	5.1	5.0	4.9	4.5	4.6
11	4.3	5.2	7.6	7.0	5.9	6.0	5.0	5.1	5.0	4.9	4.6	4.6
12	4.4	5.6	7.5	6.9	5.9	6.0	5.0	5.1	5.0	4.9	4.6	4.6
13	4.5	5.6	7.5	6.8	5.8	5.9	4.9	5.1	5.0	4.9	4.6	4.5
14	4.6	5.5	7.5	6.8	5.8	5.9	4.9	5.1	5.0	4.95	4.6	4.5
15	5.0	5.3	7.65	6.8	5.8	5.8	4.9	5.1	5.0	4.95	4.6	4.5
16	5.0	5.2	7.6	6.7	5.8	5.8	5.0	5.1	5.0	4.9	4.6	4.5
17	5.0	5.2	7.45	6.5	5.8	5.7	5.0	5.1	5.0	4.9	4.7	4.6
18	5.5	5.2	7.5	6.4	5.8	5.6	5.0	5.1	5.0	4.9	4.6	4.6
19	7.25	5.2	7.55	6.3	5.8	5.6	5.0	5.1	5.0	4.9	4.6	4.6
20	7.75	5.2	7.6	6.3	5.8	5.5	5.0	5.1	5.0	4.85	4.6	4.6
21	6.5	5.1	7.8	6.3	5.7	5.5	5.0	5.1	5.0	4.85	4.6	4.6
22	6.0	5.1	7.75	6.3	5.7	5.4	5.0	5.1	5.0	4.8	4.6	4.5
23	6.0	5.1	8.0	6.1	5.7	5.4	5.0	5.1	5.0	4.8	4.6	4.5
24	6.4	5.1	8.0	6.0	5.7	5.4	5.0	5.1	5.0	4.8	4.6	4.5
25	6.2	5.0	8.0	5.9	5.7	5.3	5.0	5.1	5.0	4.8	4.6	4.5
26	6.3	5.0	7.75	6.0	5.7	5.3	5.0	5.1	5.0	4.8	4.6	4.5
27	6.5	5.0	7.3	6.2	5.8	5.3	5.0	5.1	5.0	4.8	4.6	4.5
28	7.25	5.45	7.1	6.1	5.8	5.2	5.0	5.1	5.0	4.8	4.5	4.6
29	7.9	.....	6.65	6.0	5.8	5.2	5.0	5.1	5.0	4.8	4.5	4.6
30	7.2	.....	6.95	6.0	5.7	5.1	5.0	5.1	5.0	4.8	4.5	4.6
31	7.35	.....	7.1	.....	5.7	.....	5.0	5.1	.....	4.8	.....	4.6

Daily discharge, in second-feet, of Stony Creek near Fruto, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	118	2,210	1,220	1,650	690	465	125	161	161	125	68	15
2	93	2,340	1,710	1,710	770	465	125	161	125	125	68	15
3	93	2,210	8,760	1,710	690	465	95	161	125	125	68	15
4	93	1,580	12,500	1,710	690	465	95	161	125	125	68	27
5	93	1,220	8,040	2,250	690	465	95	161	125	125	45	27
6	93	940	15,400	2,790	610	465	95	161	125	95	45	27
7	93	695	9,620	1,960	610	610	95	161	125	95	45	27
8	72	550	8,020	1,710	535	860	95	161	125	95	15	27
9	72	425	4,330	1,710	535	690	161	161	125	95	15	27
10	72	315	2,870	1,710	610	690	161	161	125	95	15	27
11	72	425	2,550	1,710	610	690	125	161	125	95	27	27
12	93	695	2,400	1,590	610	690	125	161	125	95	27	27
13	118	695	2,400	1,480	535	610	95	161	125	95	27	15
14	145	620	2,400	1,480	535	610	95	161	125	110	27	15
15	315	485	2,630	1,480	535	535	95	161	125	110	27	15
16	315	425	2,550	1,370	535	535	125	161	125	95	27	15
17	315	425	2,320	1,150	535	465	125	161	125	95	45	27
18	620	425	2,400	1,050	535	405	125	161	125	95	27	27
19	2,560	425	2,480	950	535	405	125	161	125	95	27	27
20	3,360	425	2,550	950	535	350	125	161	125	82	27	27
21	1,580	370	2,870	950	465	350	125	161	125	82	27	27
22	1,030	370	2,790	950	465	300	125	161	125	68	27	15
23	1,030	370	3,200	770	465	300	125	161	125	68	27	15
24	1,460	370	3,200	690	465	300	125	161	125	68	27	15
25	1,220	315	3,200	610	465	250	125	161	125	68	27	15
26	1,340	315	2,790	690	465	250	125	161	125	68	27	15
27	1,580	315	2,100	860	535	250	125	161	125	68	27	15
28	2,560	585	1,830	770	535	203	125	161	125	68	15	27
29	3,610	.....	1,320	690	535	203	125	161	125	68	15	27
30	2,490	.....	1,650	690	465	161	125	161	125	68	15	27
31	2,720	.....	1,830	.....	465	.....	125	161	.....	68	.....	27

NOTE.—Daily discharge determined from two rating curves fairly well defined except at extreme high and extreme low stages. The change in rating was made Mar. 7.

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Monthly discharge of Stony Creek near Fruto, Cal., for 1911.

[Drainage area, 601 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	3,610	72	949	1.58	1.82	58,400	C.
February	2,340	315	734	1.22	1.27	40,800	C.
March	15,400	1,220	4,000	6.66	7.68	246,000	C.
April	2,790	610	1,330	2.21	2.47	79,100	B.
May	770	465	557	.927	1.07	34,200	B.
June	860	161	450	.749	.84	26,800	B.
July	161	95	119	.198	.23	7,320	B.
August	161	161	161	.268	.31	9,900	B.
September	161	125	126	.210	.23	7,500	B.
October	125	68	91.2	.152	.18	5,610	B.
November	68	15	32.5	.054	.06	1,930	C.
December	27	15	22.0	.037	.04	1,350	C.
The year	15,400	15	716	1.19	16.20	519,000	

LITTLE STONY CREEK NEAR LODOGA, CAL.

Location.—At East Park reservoir, 4 miles above junction with Stony Creek and 3½ miles northwest of Lodoga.

Records available.—January 1, 1908, to December 31, 1911.

Drainage area.—102 square miles.

Gage.—Previous to December 1, 1910, the station was maintained a short distance below the present site. Several gages with independent datums were used. Beginning with December 1, 1910, the record is from the gage at the dam.

Discharge.—Computed from gage heights observed at the dam. Correction has been made for evaporation, which is determined from records obtained from an evaporation pan at the reservoir.

Accuracy.—Considerable care is used in collecting these data and results should be good.

Cooperation.—Record furnished by United States Reclamation Service through A. N. Burch, acting project engineer.

Daily gage height, in feet, of East Park reservoir near Lodoga, Cal., for 1911.

[J. Lea, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	20.4	56.4	67.1	75.6	80.6	82.3	82.6	79.2	73.6	67.8	63.1	62.5
2	20.5	58.0	67.4	75.9	80.7	82.4	82.6	79.0	73.5	67.6	63.0	62.5
3	20.6	59.1	68.5	76.1	80.8	82.4	82.6	78.8	73.3	67.4	62.9	62.5
4	20.7	60.0	72.4	76.3	80.9	82.4	82.6	78.7	73.1	67.2	62.8	62.6
5	20.8	60.8	76.3	76.6	81.0	82.5	82.5	78.5	72.9	67.0	62.7	62.6
6	20.9	61.3	80.2	77.0	81.0	82.5	82.5	78.3	72.7	66.8	62.7	62.6
7	21.0	61.8	85.8	77.4	81.1	82.5	82.5	78.1	72.5	66.6	62.6	62.6
8	21.1	62.2	85.9	77.7	81.2	82.6	82.4	78.0	72.3	66.4	62.6	62.6
9	21.2	62.5	85.2	77.9	81.3	82.6	82.3	77.8	72.1	66.3	62.6	62.6
10	21.3	62.7	84.9	78.1	81.3	82.6	82.2	77.6	71.9	66.0	62.6	62.6
11	21.6	63.5	84.5	78.3	81.4	82.6	82.1	77.5	71.7	65.9	62.6	62.6
12	23.5	63.7	83.9	78.5	81.4	82.7	82.0	77.3	71.5	65.8	62.6	62.6
13	24.3	64.2	83.4	78.7	81.5	82.7	81.9	77.1	71.3	65.6	62.6	62.6
14	24.9	64.5	83.3	78.8	81.6	82.7	81.8	76.9	71.1	65.4	62.6	62.6
15	25.6	64.8	82.9	78.9	81.6	82.7	81.7	76.8	70.9	65.3	62.5	62.6

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Daily gage height, in feet, of East Park reservoir near Lodoga, Cal., for 1911—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
16	26.2	65.1	82.4	79.1	81.6	82.7	81.6	76.6	70.7	65.1	62.5	62.6
17	26.5	65.3	81.9	79.2	81.7	82.7	81.5	76.4	70.5	64.9	62.5	62.6
18	27.1	65.5	81.4	79.3	81.7	82.7	81.3	76.2	70.3	64.7	62.5	62.6
19	28.4	65.7	80.7	79.4	81.8	82.7	81.2	76.0	70.1	64.6	62.5	62.6
20	36.0	65.9	79.8	79.5	81.8	82.7	81.0	75.8	69.9	64.4	62.5	62.6
21	37.7	66.0	79.0	79.6	81.9	82.7	80.9	75.7	69.7	64.3	62.5	62.6
22	38.1	66.1	78.3	79.7	81.9	82.7	80.7	75.5	69.5	64.2	62.5	62.6
23	38.4	66.3	77.6	79.8	82.0	82.7	80.6	75.3	69.3	64.0	62.5	62.6
24	38.9	66.4	76.9	79.9	82.0	82.7	80.4	75.1	69.1	63.9	62.5	62.6
25	40.0	66.5	76.1	80.0	82.1	82.6	80.3	74.9	68.9	63.8	62.5	62.6
26	41.0	66.6	75.2	80.1	82.1	82.6	80.1	74.7	68.7	63.7	62.5	62.6
27	41.8	66.7	74.9	80.2	82.2	82.6	80.0	74.5	68.6	63.6	62.5	62.6
28	45.6	66.9	74.9	80.3	82.2	82.6	79.8	74.3	68.4	63.5	62.5	62.7
29	50.3	.....	75.0	80.4	82.2	82.6	79.7	74.2	68.2	63.4	62.5	62.7
30	53.4	.....	75.2	80.5	82.3	82.6	79.5	74.0	68.0	63.3	62.5	62.7
31	55.3	.....	75.4	.....	82.3	.....	79.4	73.8	.....	63.2	.....	62.7

Daily discharge, in second-feet, of Little Stony Creek near Lodoga, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3	396	100	106	80	44	18	16	11	7	2	6
2	3	599	150	217	78	46	20	16	10	7	2	6
3	4	421	575	136	78	48	18	16	10	7	2	6
4	3	351	2,220	136	78	48	18	17	10	7	2	7
5	3	362	2,580	224	90	49	18	17	11	7	2	7
6	3	237	2,820	290	40	44	18	14	11	7	2	7
7	3	227	4,980	282	40	47	18	16	11	7	2	7
8	2	186	2,450	217	78	44	16	16	11	7	3	7
9	3	141	1,450	144	78	46	16	16	11	7	3	7
10	3	91	1,250	152	40	44	18	14	11	7	3	7
11	8	378	935	144	40	44	18	16	10	7	3	7
12	57	101	800	146	46	44	17	16	11	7	3	7
13	31	232	760	152	46	15	15	16	11	7	3	7
14	30	146	700	71	78	17	17	16	10	7	3	7
15	34	141	675	68	31	17	17	16	11	7	3	7
16	30	146	600	152	31	20	19	16	11	7	3	7
17	30	96	600	76	32	20	16	16	11	5	3	7
18	32	101	600	73	40	20	14	15	11	5	3	6
19	80	96	575	88	40	20	17	17	11	5	3	6
20	709	93	545	83	40	20	17	15	11	5	3	6
21	230	50	525	88	40	17	17	15	9	5	3	6
22	59	50	550	83	46	17	17	11	9	5	3	6
23	43	101	500	88	46	20	17	11	9	5	3	6
24	71	50	500	75	40	20	17	11	9	2	3	6
25	164	50	425	68	40	20	14	9	9	2	3	6
26	181	50	400	78	40	13	16	11	9	2	3	6
27	146	50	375	90	40	11	16	11	9	2	3	6
28	760	101	300	75	31	11	16	10	8	2	3	6
29	1,140	.....	235	73	31	18	16	10	7	2	3	6
30	907	.....	200	83	32	18	14	11	7	2	3	6
31	637	.....	150	.....	31	.....	14	11	.....	2	.....	6

NOTE.—Daily discharge based on the water-surface elevation of East Park reservoir, the daily accumulation, and the evaporation loss. On account of the extreme water-tightness of the storage basin, seepage losses were assumed to be negligible.

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Monthly discharge of Little Stony Creek near Lodoga, Cal., for 1911.

[Drainage area, 102 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
January	1,140	2	174	1.71	1.97	10,700
February	599	50	180	1.76	1.83	10,000
March	4,980	100	952	9.33	10.76	58,500
April	290	68	125	1.23	1.37	7,440
May	90	31	49.1	.481	.55	3,020
June	49	11	28.7	.281	.31	1,710
July	20	14	16.7	.164	.19	1,030
August	17	9	14.1	.138	.16	867
September	11	7	10.0	.098	.11	595
October	7	2	5.3	.052	.06	326
November	3	2	2.8	.028	.03	167
December	7	6	6.5	.063	.07	400
The year	4,980	2	131	1.28	17.41	94,800

FEATHER RIVER AND TRIBUTARIES.

FEATHER RIVER AT OROVILLE, CAL.

Location.—At highway bridge at Oroville, in sec. 8, T. 19 N., R. 4 E., 6 miles below junction of North and Middle Forks and 30 miles above the mouth of Yuba River.

Records available.—January 1, 1902, to December 31, 1911.

Drainage area.—3,640 square miles.

Gage.—United States Weather Bureau vertical staff gage on pier of highway bridge on right bank. This station was maintained at bridge from 1902 to 1905. In December, 1905, a gage was installed on the left bank about 1,000 feet upstream. Gage heights for 1906–1910 were referred to this gage. The Weather Bureau gage was read during 1911.

Channel.—Somewhat shifting at high stages.

Discharge measurements.—Made from car and cable 1,000 feet above bridge.

Accuracy.—Discharge rating curves for 1911 are good. Daily and monthly discharges are withheld, however, pending the verifications of the gage heights for the latter part of the year.

Cooperation.—Gage-height record furnished by United States Weather Bureau through N. R. Taylor, local forecaster.

Discharge measurements of Feather River at Oroville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 26	J. E. Stewart	6.15	10,800
30	do	[a] 11.50	57,300
30	do	[a] 11.72	58,900
31	do	12.80	67,400
Mar. 24	do	7.68	20,700
May 26	do	7.52	18,200
July 11	do	4.01	4,730
Oct. 6	do	1.70	1,960

[a] Gage height obtained from relation curve for the two gages based on simultaneous readings made during 1910 and 1911.

Note.—Gage heights referred to Weather Bureau gage ½ mile below United States Geological Survey gage

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Daily gage height, in feet, of Feather River at Oroville, Cal., for 1911.

[U. S. Weather Bureau, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.6	9.6	4.1	9.8	8.0	7.7	4.9	2.0	1.0	0.9	1.0	1.0
2	1.6	8.3	4.6	9.8	8.0	8.0	4.7	1.9	1.0	1.0	1.2	1.0
3	1.6	8.1	4.6	10.0	8.0	8.1	4.7	1.9	1.1	1.0	1.2	1.0
4	1.6	7.2	5.8	10.0	8.7	8.1	4.6	1.8	1.0	1.0	1.3	1.0
5	1.6	6.8	6.1	10.2	9.1	8.0	4.5	1.8	1.0	1.1	1.2	.9
6	1.6	6.4	7.1	12.4	9.0	8.0	4.4	1.7	1.1	1.0	1.4	1.1
7	1.6	6.2	10.2	10.9	8.5	8.0	4.3	1.7	1.1	1.0	.7	1.1
8	1.5	5.9	8.3	10.0	8.2	8.0	4.2	1.7	1.1	1.0	.8	1.2
9	1.5	5.6	7.3	9.7	8.0	7.6	4.0	1.6	1.1	1.3	1.0	1.1
10	2.0	5.5	6.9	9.6	7.9	7.6	4.0	1.6	1.0	1.3	2.0	1.2
11	2.1	6.3	6.5	8.8	7.9	7.6	3.8	1.6	1.0	1.2	2.3	1.1
12	2.5	5.6	6.2	8.1	8.0	7.6	3.6	1.6	1.0	1.1	1.6	1.1
13	3.5	6.0	6.0	7.6	8.1	7.5	3.5	1.4	1.1	1.0	1.5	1.1
14	4.8	5.5	5.9	7.3	8.0	7.5	3.4	1.3	1.1	1.1	1.6	1.1
15	4.1	5.2	5.9	7.0	7.9	7.2	3.3	1.3	1.1	1.0	1.5	1.2
16	2.8	4.9	5.9	7.0	7.8	7.0	3.2	1.5	1.2	1.0	2.0	1.2
17	2.4	4.8	6.0	7.2	7.5	7.0	3.2	1.3	1.1	1.0	1.6	1.4
18	2.2	4.8	6.1	7.5	7.4	6.9	3.2	1.3	1.0	1.0	1.5	1.3
19	2.0	4.7	6.2	8.0	7.6	6.8	3.0	1.3	1.0	.9	1.5	1.3
20	7.4	4.6	6.4	8.0	7.5	6.6	3.0	1.5	.9	.8	1.7	1.3
21	5.1	4.6	6.6	8.0	7.6	6.5	2.8	1.5	.9	.8	1.4	1.2
22	4.9	4.4	7.0	8.1	8.0	6.1	2.7	1.4	1.0	1.2	1.3	1.3
23	4.3	4.4	7.2	8.5	8.3	5.8	2.5	1.3	1.0	1.0	1.3	1.3
24	6.2	4.4	7.7	9.0	8.4	5.6	2.5	1.3	1.1	1.5	1.3	1.3
25	7.8	4.3	7.8	9.5	8.0	5.4	2.5	1.6	1.0	1.2	1.1	1.2
26	6.8	4.2	7.7	9.8	7.7	5.4	2.3	1.2	.9	1.2	1.3	1.2
27	5.8	4.1	7.7	9.5	7.6	5.3	2.3	1.2	1.5	1.1	1.2	1.2
28	7.3	4.0	7.8	9.0	7.6	5.1	2.2	1.1	1.0	1.1	1.0	1.4
29	6.2	.....	8.1	8.3	7.7	5.0	2.1	1.1	1.0	1.1	1.0	1.4
30	9.2	.....	8.6	8.0	7.7	5.0	2.0	1.1	1.1	1.1	1.2	1.4
31	13.3	.....	9.0	.....	7.9	.....	2.0	1.0	.....	1.2	.....	1.5

NOTE.—Gage heights from about August to December liable to error.

Daily discharge, in second-feet, of Feather River at Oroville, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1,750	35,900	4,880	33,200	22,000	19,900	6,680	2,100	1,270	1,200	1,270	1,270
2	1,750	24,400	5,930	37,700	22,000	22,000	6,170	2,010	1,270	1,270	1,430	1,270
3	1,750	22,800	5,930	39,500	22,000	22,800	6,170	2,010	1,350	1,270	1,430	1,270
4	1,750	17,000	9,580	39,500	27,800	22,800	5,930	1,920	1,270	1,270	1,510	1,270
5	1,750	14,600	10,900	41,500	31,400	22,000	5,700	1,920	1,270	1,350	1,430	1,200
6	1,750	12,400	16,400	65,100	30,500	22,000	5,480	1,830	1,350	1,270	1,590	1,350
7	1,750	11,400	41,500	48,500	26,200	22,000	5,270	1,830	1,350	1,270	1,060	1,350
8	1,670	10,000	24,400	39,500	23,600	22,000	5,070	1,830	1,350	1,270	1,130	1,430
9	1,670	8,800	17,500	36,800	22,000	19,300	4,700	1,750	1,350	1,510	1,270	1,350
10	2,100	8,450	15,200	35,900	21,200	19,300	4,700	1,750	1,270	1,510	2,100	1,430
11	2,200	11,900	13,000	28,700	21,200	19,300	4,360	1,750	1,270	1,430	2,420	1,350
12	2,640	8,800	11,400	22,800	22,000	19,300	4,050	1,750	1,270	1,350	1,750	1,350
13	3,900	10,400	10,400	19,300	22,800	18,700	3,900	1,590	1,350	1,270	1,070	1,350
14	6,420	8,450	10,000	17,500	22,000	18,700	3,760	1,510	1,350	1,350	1,750	1,350
15	4,880	7,520	10,000	15,800	21,200	17,000	3,620	1,510	1,350	1,270	1,070	1,430
16	2,990	6,680	10,000	15,800	20,600	15,800	3,490	1,670	1,430	1,270	2,100	1,430
17	2,530	6,420	10,400	17,000	18,700	15,800	3,490	1,510	1,350	1,270	1,750	1,590
18	2,310	6,420	10,900	18,700	18,100	15,200	3,490	1,510	1,270	1,270	1,070	1,510
19	2,100	6,170	11,400	22,000	19,300	14,600	3,230	1,510	1,270	1,200	1,070	1,510
20	18,100	5,930	12,400	22,000	18,700	13,500	3,230	1,670	1,200	1,130	1,830	1,510
21	7,230	5,930	13,500	22,000	19,300	13,000	2,990	1,670	1,200	1,130	1,590	1,430
22	6,680	5,480	15,800	22,800	22,000	10,900	2,870	1,590	1,270	1,430	1,510	1,510
23	5,210	5,480	17,000	26,200	24,400	9,580	2,640	1,510	1,270	1,270	1,510	1,510
24	11,400	5,480	19,900	30,500	25,300	8,800	2,640	1,510	1,350	1,670	1,510	1,510
25	20,600	5,270	20,600	35,000	22,000	8,130	2,640	1,750	1,270	1,430	1,350	1,430

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Daily discharge, in second-feet, of Feather River at Oroville, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26	14,600	5,070	19,900	37,700	19,900	8,130	2,420	1,430	1,200	1,430	1,510	1,430
27	9,580	4,880	19,900	35,000	19,300	7,820	2,420	1,430	1,670	1,350	1,430	1,430
28	17,500	4,700	20,600	30,500	19,300	7,230	2,310	1,350	1,270	1,350	1,270	1,590
29	11,400	.....	22,800	24,400	19,900	6,950	2,200	1,350	1,270	1,350	1,270	1,590
30	32,300	.....	27,000	22,000	19,900	6,950	2,100	1,350	1,350	1,350	1,430	1,590
31	75,400	.....	30,500	.....	21,200	.....	2,100	1,270	.....	1,430	.....	1,670

NOTE.—Daily discharge determined from a rating curve based on discharge measurements made during 1910 to 1912, and which is well defined above a discharge of 3,000 second-feet, and fairly well defined below that discharge. Daily discharges for August to December are believed to be too low because of regulation of the flow at Big Bend. They are also believed to be in error because of poor gage reading at low stages.

Monthly discharge of Feather River at Oroville, Cal., for 1911.

[Drainage area, 3,640 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	75,400	1,670	8,960	2.46	2.84	551,000	A.
February	35,900	4,700	10,200	2.80	2.92	566,000	A.
March	41,500	4,880	15,800	4.34	5.00	972,000	A.
April	65,100	15,800	30,100	8.27	9.23	1,790,000	A.
May	31,400	18,100	22,100	6.07	7.00	1,360,000	A.
June	22,800	6,950	15,600	4.29	4.79	928,000	A.
July	6,680	2,100	3,870	1.06	1.22	238,000	B.
August	2,100	1,270	1,650	.453	.52	101,000	D.
September	1,670	1,200	1,310	.360	.40	78,000	C.
October	1,670	1,130	1,330	.365	.42	81,800	C.
November	2,420	1,060	1,560	.429	.48	92,800	B.
December	1,670	1,200	1,430	.393	.45	87,900	B.
The year	75,400	1,060	9,470	2.60	35.27	6,850,000	

INDIAN CREEK NEAR CRESCENT MILLS, CAL.

Location.—At the lower end of Indian Valley, in the SW. ¼ sec. 25, T. 26 N., R. 9 E., about 2,000 feet below Arlington Bridge, and 1¼ miles below Crescent Mills. Spanish Creek enters 4 miles below the station.

Records available.—January 1, 1906, to December 31, 1909, and September 10 to December 31, 1911.

Drainage area.—740 square miles.

Gage.—Vertical staff in two sections on right bank opposite observer's house.

Channel.—Fairly permanent. At low stages water is deep and sluggish at gage.

Discharge measurements.—Made from Arlington Bridge or by wading. The car and cable at the gage were destroyed by the flood of 1907.

Diversions.—Water is diverted from Indian Creek to irrigate Indian and Genesee valleys.

Accuracy.—Results are good.

Discharge measurements of Indian Creek near Crescent Mills, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 10[a]	H. D. McGlashan	1.38	57
Oct. 23[b]	G. T. Peekema	1.57	85

[a] Measurement made by wading 400 feet below gage.
[b] Measurement made by wading 300 feet below gage.

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Daily gage height, in feet, and discharge, in second-feet, of Indian Creek near Crescent Mills, Cal., for 1911.

[Eugene Cook, observer.]

Day.	September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1	.....	.....	1.45	67	1.60	89	1.90	137
2	.....	.....	1.45	67	1.60	89	1.90	137
3	.....	.....	1.45	67	1.60	89	1.90	137
4	.....	.....	1.50	74	1.60	89	1.90	137
5	.....	.....	1.55	82	1.60	89	1.90	137
6	.....	.....	1.60	89	1.60	89	1.90	137
7	.....	.....	1.60	89	1.65	96	1.90	137
8	.....	.....	1.60	89	1.70	104	1.90	137
9	.....	.....	1.60	89	1.70	104	1.90	137
10	1.38	57	1.55	82	2.00	155	1.85	128
11	1.38	57	1.55	82	2.00	155	1.85	128
12	1.38	57	1.55	82	1.95	146	1.85	128
13	1.38	57	1.55	82	1.95	146	1.80	120
14	1.38	57	1.55	82	2.00	155	1.80	120
15	1.35	54	1.55	82	2.10	174	1.80	120
16	1.35	54	1.55	82	2.15	184	1.80	120
17	1.35	54	1.55	82	2.20	194	1.80	120
18	1.35	54	1.55	82	2.20	194	1.80	120
19	1.30	47	1.55	82	2.15.	184	1.80	120
20	1.30	47	1.55	82	2.10	174	1.80	120
21	1.30	47	1.55	82	2.05	164	1.80	120
22	1.30	47	1.55	82	2.00	155	1.80	120
23	1.30	47	1.55	82	2.00	155	1.80	120
24	1.35	54	1.55	82	2.00	155	1.75	112
25	1.35	54	1.55	82	1.95	146	1.75	112
26	1.40	60	1.55	82	1.95	146	1.75	112
27	1.45	67	1.55	82	1.90	137	1.75	112
28	1.45	67	1.55	82	1.90	137	1.75	112
29	1.45	67	1.60	89	1.90	137	1.75	112
30	1.45	67	1.60	89	1.90	137	1.75	112
31	.....	.....	1.60	89	.....	.....	1.75	112

NOTE.—Daily discharge determined from a fairly well-defined rating curve.

Monthly discharge of Indian Creek near Crescent Mills, Cal., for 1911.

[Drainage area, 740 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
Sept. 10–30	67	47	55.8	0.075	0.06	2,320	B.
October	89	67	81.9	.111	.13	5,040	B.
November	194	89	139	.188	.21	8,270	B.
December	137	112	124	.168	.19	7,620	B.

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SPANISH CREEK AT KEDDIE, CAL.

Location.—At highway bridge at Keddie, in the SW. ¼ sec. 22, T. 25 N., R. 9 E, 2 miles above junction with Indian Creek.
Records available.—October 22 to December 31, 1911.
Drainage area.—Not measured.
Gage.—High-water section painted on left abutment of bridge. A vertical section for low water is fastened to a stump on left bank 20 feet below bridge.
Channel.—Gravel.
Discharge measurements.—Made from downstream side of bridge or by wading.
Diversions.—Water is diverted from Spanish Creek to irrigate American Valley.

The following discharge measurement was made by G. T. Peekema by wading 70 feet below the gage:

October 22, 1911: Gage height, 1.71 feet; discharge, 69 second-feet.

Daily gage height, in feet, of Spanish Creek at Keddie, Cal., for 1911.

[R. F. Koonter, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	1.71	1.78	11	.....	1.76	1.78	21	.....	1.82	1.78
2	.....	1.71	1.78	12	.....	1.78	1.78	22	1.71	1.75	1.78
3	.....	1.71	1.78	13	.....	1.81	1.80	23	1.71	1.74	1.78
4	.....	1.71	1.80	14	.....	1.86	1.79	24	1.70	1.72	1.79
5	.....	1.72	1.80	15	.....	1.88	1.78	25	1.70	1.73	1.79
6	.....	1.72	1.81	16	.....	1.91	1.78	26	1.71	1.76	1.80
7	.....	1.72	1.83	17	.....	1.90	1.80	27	1.71	1.77	1.80
8	.....	1.73	1.81	18	.....	1.88	1.80	28	1.70	1.77	1.82
9	.....	1.73	1.80	19	.....	1.85	1.79	29	1.71	1.78	1.82
10	.....	1.75	1.80	20	.....	1.84	1.79	30	1.72	1.77	1.80
								31	1.72	.....	1.81

MIDDLE FORK OF FEATHER RIVER AT CROMBERG, CAL.

Location.—At California White Pine Co.'s log chute, in the N. ½ sec. 24, T. 23 N., R. 11 E., 600 feet southwest of post office at Cromberg, in Plumas National Forest. Jamison Creek enters 4 miles above and Jackson Creek one-half mile below the station.
Records available.—November 3, 1910, to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff on pier of log chute.
Channel.—Gravel and cobblestones.
Discharge measurements.—Car and cable 200 feet above gage or by wading.
Cooperation.—Gage-height record furnished by United States Forest Service.

Estimates are withheld until additional measurements are secured.

The following discharge measurement was made by G. T. Peekema by wading 1,500 feet below the gage:

October 28, 1911: Gage height, 2.54 feet; discharge, 89 second-feet.

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Daily gage height, in feet, of Middle Fork of Feather River at Cromberg, Cal., for 1911.

[J. E. Nall, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				10.3							2.6	
2										2.6	2.6	
3				10.8						2.6		2.9
4				10.5					2.5	2.6	2.6	2.9
5		5.1		10.45					2.5		2.6	2.9
6			4.0	11.0						2.6	2.6	2.9
7				13.0			4.0			2.6	2.6	2.9
8		4.0					4.0	3.05	2.5	2.6		2.9
9			4.2				4.0	3.05	2.5	2.6		2.85
10									2.5			2.85
11						5.3		2.95		2.6		
12			4.1	7.0		5.3		2.95			2.7	
13		3.2					3.9				2.7	
14									2.5			
15			4.2						2.5			
16			4.2		6.0		3.85					2.85
17												2.85
18									2.5			2.85
19									2.5			2.85
20		2.85			5.25			2.9	2.5			
21							3.2	2.9		2.6		
22			6.4				3.2	2.85	2.5			2.8
23									2.5			2.8
24	5.4	2.75	7.5								2.9	
25			7.8				3.2	2.6	2.5	2.6	2.9	
26			8.0					2.6		2.6	2.9	
27			8.3					2.6	2.55	2.6	2.9	
28		2.55	8.5			4.5	3.1		2.6			
29			9.3			4.5			2.6		2.9	
30	6.2		10.0							2.6	2.9	
31			10.0		5.8					2.6		

MIDDLE FORK OF FEATHER RIVER NEAR OROVILLE, CAL.

Location.—At highway bridge at Bidwell Bar, in the NW. ¼ sec. 32, T. 26 N., R. 5 E., 2 miles above junction with the North Fork and 7 miles northeast of Oroville. South Fork enters 1¼ miles above and Canyon Creek three-fourths of a mile below the station.

Records available.—October 7 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in three sections: High-water section is fastened to lower end of bridge pier near left bank. Remainder of gage is fastened to a sycamore tree on left bank 100 feet above bridge.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from car and cable one-half mile below bridge.

The following discharge measurement was made by F. C. Ebert:

December 15, 1911: Gage height, 2.90 feet; discharge, 368 second-feet.

Daily gage height, in feet, of Middle Fork of Feather River near Oroville, Cal., for 1911.

[T. W. Curry, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1		2.8	2.9	11	2.9	3.8	2.95	21	2.7	3.1	2.82
2		2.75	2.9	12	2.85	3.25	2.95	22	2.75	3.0	2.72
3		2.75	2.9	13	2.85	3.15	2.85	23	2.75	3.0	2.82
4		2.8	2.9	14	2.8	3.0	2.85	24	2.7	3.0	2.92
5		2.8	2.9	15	2.8	3.05	2.85	25	2.7	3.0	2.70
6		2.8	2.9	16	2.75	3.2	2.88	26	2.8	3.0	2.65
7	2.8	2.8	2.95	17	2.75	3.25	3.02	27	2.9	3.0	2.70
8	2.8	2.8	2.95	18	2.75	3.1	2.92	28	2.8	2.95	3.10
9	2.9	2.85	2.95	19	2.7	3.15	2.85	29	2.8	2.95	2.95
10	2.9	4.6	2.9	20	2.7	3.1	2.85	30	2.8	2.95	2.92
								31	2.8		2.92

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SOUTH FORK OF FEATHER RIVER AT ENTERPRISE, CAL.

Location.—One-half mile above highway bridge at Enterprise, in the NE. ¼ sec. 1, T. 19 N., R. 6 E., and about 700 feet above mouth of McCabe Creek.
Records available.—October 8 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff in two sections on left bank one-half mile above bridge.
Channel.—Gravel and small bowlders.
Discharge measurements.—Made from bridge below gage or by wading.
Diversions.—The diversion dam of the Palermo Land & Water Co.'s canal is located 1 mile above the station. The canal record must be added to obtain the total run-off from this drainage.

Discharge measurements of South Fork of Feather River at Enterprise, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 8[a]	J. E. Stewart	0.87	6.0
Dec. 17[b]	F. C. Ebert	1.40	44

[a] Made by wading below highway bridge, one-quarter mile below gage.
[b] Made by wading 300 feet below gage.

Daily gage height, in feet, of South Fork of Feather River at Enterprise, Cal., for 1911.

[Gus Alm, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	1.1	1.3	11	1.1	1.65	1.2	21	0.75	1.3	1.32
2	.....	1.0	1.3	12	1.05	1.4	1.2	22	.75	1.3	1.35
3	.....	1.0	1.3	13	1.05	1.3	1.2	23	.75	1.3	1.35
4	.....	1.1	1.2	14	1.05	1.3	1.2	24	.75	1.3	1.32
5	.....	1.1	1.2	15	1.0	1.3	1.2	25	.85	1.3	1.32
6	.....	1.05	1.2	16	1.0	1.6	1.49	26	1.0	1.3	1.32
7	.....	1.05	1.2	17	1.0	1.45	1.33	27	1.2	1.3	1.43
8	0.85	1.05	1.2	18	.95	1.35	1.31	28	1.2	1.3	1.49
9	1.0	1.05	1.2	19	.75	1.25	1.31	29	1.2	1.3	1.49
10	1.2	2.4	1.2	20	.75	1.2	1.31	30	1.2	1.3	1.45
								31	1.1	.....	1.51

PALERMO LAND & WATER CO.'S CANAL AT ENTERPRISE, CAL.

Location.—Above footbridge, in the NE. ¼ sec. 1, T. 19 N., R. 6 E., at Enterprise.
Records available.—October 8 to December 31, 1911.
Gage.—Vertical staff fastened to post on right bank 15 feet above footbridge.
Channel.—Gravel and sand.
Discharge measurements.—Made from footbridge or by wading.

This canal furnishes water for irrigation below Oroville.

Discharge measurements of Palermo Land & Water Co.'s canal at Enterprise, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 8[a]	J. E. Stewart	1.30	37
Dec. 17[b]	F. C. Ebert	.36	12

[a] Made by wading 10 feet below gage.
[b] Made from footbridge 15 feet below gage.

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Daily gage height, in feet, of Palermo Land & Water Co.'s canal at Enterprise, Cal., for 1911.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	0.95	0.7	11	1.05	0.9	0.7	21	1.3	0.7	0.39
2	.....	.95	.7	12	1.15	.9	.7	22	1.3	.7	.39
3	.....	.95	.7	13	1.1	.9	.7	23	1.3	.7	.43
4	.....	.95	.7	14	.95	.9	.7	24	1.3	.7	.42
5	.....	.95	.7	15	1.05	.9	.7	25	1.3	.7	.51
6	.....	.95	.7	16	1.05	.9	.7	26	1.3	.7	.62
7	.....	.95	.7	17	1.05	.9	.36	27	1.2	.7	.52
8	1.3	.95	.7	18	1.05	.9	.40	28	1.1	.7	.45
9	1.3	1.0	.7	19	1.3	.9	.40	29	1.0	.7	.45
10	1.2	1.0	.7	20	1.3	.7	.40	30	1.0	.7	.43
								31	.95	.....	.43

MIDDLE FORK OF YUBA RIVER [1] NEAR NORTH SAN JUAN, CAL.

Location.—Below highway bridge at Freemans Bridge, in the N. ½ NW. ¼ sec. 23, T. 18 N., R. 8 E., in the Tahoe National Forest, 1¼ miles northeast of North San Juan in Tahoe National Forest. Oregon Creek enters three-fourths mile above, Moonshine Creek one-fourth mile below, and North Fork of Yuba River about 4 miles below the station.

Records available.—October 27, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff wedged between two large bowlders on right bank one-fourth mile below the bridge.

Channel.—Gravel and small bowlders.

Discharge measurements.—Made from highway bridge or by wading. As the channel is very rough at the bridge, a car and cable were installed on November 7, 1911, 200 feet above the gage.

Winter flow.—Some ice in the stream during the last week in December. This occurrence is unusual.

Accuracy.—As measurements made from the bridge are not considered reliable, estimates are withheld until measurements at the cable section are available.

Cooperation.—Previous to August 21, 1911, gage-height record was furnished by United States Forest Service. Discharge measurements also furnished by the Forest Service.

Discharge measurements of Middle Fork of Yuba River near North San Juan, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 25[a]	G. T. Peekema	7.15	2,800
June 14[a]	do	7.05	2,710
Nov. 9[b]	do	4.32	78

[a] Measurement made from bridge. [b] By wading 150 feet above gage.

[1] Known locally as Middle Yuba River.

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Daily gage height, in feet, of Middle Fork of Yuba River near North San Juan, Cal., for 1911.

[C. E. Whittum and H. Zurhorst, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.	.....	7.5	.....	.....	.....	.....	.....	.....	.....	4.3	4.3	4.4
2.	.....	7.15	5.3	.....	.....	.....	.....	4.6	4.3	4.4	4.3	4.4
3.	.....	6.8	.....	7.0	.....	.....	.....	.....	4.3	4.3	4.3	4.4
4.	.....	6.7	6.3	.....	.....	.....	.....	.....	4.2	4.3	4.3	4.4
5.	.....	6.7	6.6	.....	.....	.....	.....	.....	4.2	4.4	4.3	4.3
6.	.....	.....	7.0	.....	6.85	.....	.....	.....	4.3	4.5	4.3	4.3
7.	.....	.....	7.9	.....	.....	7.3	5.7	.....	4.3	4.4	4.3	4.4
8.	.....	.....	7.3	.....	.....	.....	.....	.....	4.3	4.4	4.3	4.4
9.	.....	6.0	6.95	.....	.....	.....	.....	.....	4.3	4.4	4.3	4.4
10.	.....	5.8	6.6	.....	.....	.....	.....	.....	4.3	4.5	5.2	4.3
11.	.....	6.0	6.5	.....	.....	.....	.....	.....	4.3	4.5	4.6	4.3
12.	.....	5.8	.....	.....	6.8	.....	.....	.....	4.3	4.4	4.4	4.3
13.	.....	5.9	.....	.....	.....	.....	.....	.....	4.3	4.3	4.4	4.3
14.	.....	.....	.....	.....	.....	7.05	5.2	.....	4.3	4.4	4.4	4.3
15.	.....	5.5	6.3	.....	.....	.....	.....	.....	4.2	4.5	4.4	4.3
16.	.....	.....	6.3	.....	.....	.....	.....	.....	4.2	4.4	4.8	4.3
17.	.....	.....	6.2	7.05	.....	6.9	.....	.....	4.2	4.4	4.5	4.4
18.	.....	5.5	5.8	.....	.....	.....	.....	.....	4.2	4.4	4.5	4.3
19.	5.3	5.4	.....	.....	6.75	.....	.....	.....	4.2	4.4	4.5	4.3
20.	8.0	.....	.....	.....	.....	.....	.....	.....	4.2	4.4	4.5	4.3
21.	6.5	5.3	.....	.....	.....	.....	.....	4.4	4.2	4.3	4.4	4.3
22.	5.8	5.3	.....	.....	.....	.....	.....	4.4	4.2	4.3	4.4	4.3
23.	5.4	.....	.....	.....	.....	.....	.....	4.4	4.2	4.3	4.4	4.3
24.	7.7	.....	.....	.....	6.9	.....	4.9	4.3	4.2	4.3	4.4	4.3
25.	7.6	.....	.....	7.15	6.9	.....	.....	4.3	4.2	4.4	4.4	4.4
26.	6.5	.....	.....	.....	.....	6.1	.....	4.3	4.3	4.4	4.4	4.6
27.	6.0	5.4	.....	.....	.....	.....	.....	4.3	4.3	4.4	4.3	4.3
28.	6.2	.....	.....	.....	.....	.....	.....	4.3	4.4	4.4	4.3	4.4
29.	7.8	.....	.....	.....	.....	6.1	.....	4.3	4.4	4.4	4.4	4.4
30.	9.25	.....	.....	.....	.....	.....	.....	.....	4.4	4.4	4.4	4.3
31.	9.5	.....	7.2	.....	.....	.....	.....	4.3	.....	4.4	.....	4.3

YUBA RIVER NEAR SMARTSVILLE, CAL.

Location.—At The Narrows, in sec. 22, T. 16 N., R. 6 E., 1 mile north of Smartsville and 18 miles above the junction with Feather River.

Records available.—June 2, 1903, to December 31, 1911.

Drainage area.—1,220 square miles.

Gage.—Vertical staff in four sections. Three sections are on left bank and one on right bank. On account of the gradual erosion of the channel the gage datum was lowered 10 feet on August 1, 1906.

Channel.—Gravel and small bowlders, and is shifting. As the result of extensive placer mining in the early days the channel has been filled with an enormous quantity of tailings. At the station the depth of mining débris is more than 80 feet.

Discharge measurements.—Made from car and cable at gage.

Diversions and storage.—Water is diverted for power and irrigation above the station. Several small glacial lakes near the headwaters of the South Fork of Yuba are utilized as storage reservoirs.

Accuracy.—Conditions for obtaining accurate discharge data at high stages are poor, owing to the shifting of the channel and the torrential nature of the stream. Results at low and medium stages are good—at high water they should be considered approximate.

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Discharge measurements of Yuba River near Smartsville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 17	J. R. McKeel	6.60	1,810
Feb. 19	do	8.00	3,180
Apr. 30	do	9.50	8,360
May 29	do	9.90	10,600
July 9	do	7.20	3,460
23	do	5.30	1,280
Aug. 20	do	4.40	544
Sept. 3	do	4.30	462
Oct. 5	J. E. Stewart	4.43	547
Dec. 19	J. R. McKeel	4.45	538

Daily gage height, in feet, of Yuba River near Smartsville, Cal., for 1911.

[J. R. McKeel, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	14.2	7.5	11.9	9.7	10.0	7.9	4.8	4.3	4.3	4.3	4.4
2	4.9	13.7	7.5	12.5	9.5	10.3	8.0	4.8	.....	4.3	.....	4.35
3	4.9	13.1	8.6	12.4	9.7	10.6	7.8	4.8	4.3	.....	4.25	4.35
4	4.8	13.1	11.2	12.1	10.8	11.7	.....	4.8	.....	4.3	4.2	.....
5	.....	12.5	10.9	13.6	11.8	11.9	7.5	4.7	.....	4.43	.....	4.35
6	4.8	11.9	12.1	15.0	10.7	11.2	7.6	4.7	4.3	4.4	4.2	.....
7	4.8	11.4	15.1	13.4	10.5	10.9	7.5	.....	.....	4.35	.....	4.35
8	4.8	10.5	13.6	12.5	9.7	10.5	7.3	4.7	4.3	.....	4.2	.....
9	5.0	9.9	11.7	12.4	9.6	10.4	7.2	4.6	.....	4.4	4.2	4.35
10	6.0	9.4	11.2	11.6	9.4	10.6	7.1	4.6	4.3	4.45	6.4	.....
11	5.6	9.9	10.6	10.8	9.7	11.6	6.9	4.6	.....	4.4	4.95	4.3
12	9.8	.....	10.1	10.0	10.0	10.9	6.8	4.6	.....	4.35	4.6	4.25
13	8.8	9.9	9.6	9.6	10.2	10.7	6.8	4.6	4.3	4.3	4.5	.....
14	12.5	9.2	9.4	9.2	9.7	10.5	6.6	4.5	.....	4.3	4.5	4.25
15	8.8	8.8	9.2	8.9	9.4	10.4	6.6	4.5	.....	.....	4.5	.....
16	6.9	8.3	9.2	.....	9.4	10.3	6.7	4.5	4.3	4.3	5.2	4.2
17	6.6	8.2	9.3	9.1	8.9	10.5	6.6	4.5	4.3	.....	4.7	4.45
18	6.5	8.2	9.2	9.2	9.6	10.9	6.5	4.5	.....	4.3	4.6	4.35
19	6.5	8.0	9.3	9.5	9.0	10.1	6.2	4.5	4.2	4.3	4.5	4.45
20	14.0	7.9	9.5	9.4	9.1	10.0	5.9	4.4	.....	.....	.....	4.4
21	11.5	7.8	9.7	9.4	9.7	9.8	5.7	.....	4.2	4.25	4.5	4.35
22	8.3	7.7	9.9	9.7	10.2	9.3	5.5	4.4	.....	.....	.....	.....
23	7.7	7.6	9.9	10.3	10.6	8.8	5.3	4.4	4.2	4.2	4.4	4.3
24	15.0	7.5	10.0	10.6	10.1	8.4	5.3	4.4	.....	.....	.....	.....
25	13.8	7.4	10.1	11.5	9.8	8.2	5.2	.....	4.2	4.2	4.4	4.3
26	12.0	7.2	9.9	11.9	9.5	8.1	5.1	4.4	4.3	4.25	.....	.....
27	10.3	7.3	9.6	11.0	9.6	8.6	5.0	.....	4.4	4.5	4.4	4.4
28	10.5	7.1	9.8	10.0	.....	8.5	5.0	4.3	4.3	4.35	4.4	4.6
29	13.0	.....	10.3	9.4	10.0	8.2	4.9	.....	4.3	.....	.....	4.5
30	18.0	.....	11.0	9.5	10.0	8.0	.....	4.3	4.3	4.3	4.4	4.5
31	19.0	.....	11.6	.....	10.1	.....	4.9	.....	.....	4.3	.....	4.5

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Daily discharge, in second-feet, of Yuba River near Smartsville, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	541	19,700	2,460	13,400	7,900	9,140	4,800	795	465	465	465	525
2	507	17,900	2,460	15,200	7,400	10,000	5,000	795	465	465	452	495
3	507	15,800	4,180	14,900	7,900	10,800	4,610	795	465	465	438	495
4	466	15,800	9,970	14,000	10,800	14,000	4,340	795	465	465	410	495
5	466	13,700	9,190	18,600	13,700	14,600	4,060	720	465	543	410	495
6	466	11,900	12,500	23,400	10,500	12,600	4,240	720	465	525	410	495
7	466	10,500	23,000	18,000	10,600	11,700	4,060	720	465	495	410	495
8	466	8,190	18,400	15,200	7,900	10,500	3,720	720	465	510	410	495
9	550	6,800	12,600	15,200	7,660	10,200	3,560	650	465	525	410	495
10	1,220	5,730	11,200	12,800	7,150	10,800	3,400	650	465	555	2,410	490
11	895	6,800	9,480	10,500	8,140	13,700	3,100	650	465	525	910	465
12	7,160	6,000	8,190	8,400	8,900	11,700	2,960	650	465	495	650	438
13	5,110	6,800	7,000	7,400	9,460	11,100	2,960	650	465	465	585	438
14	14,100	5,320	6,500	6,500	8,140	10,800	2,680	585	465	465	585	438
15	5,110	4,540	6,070	5,800	7,400	10,500	2,680	585	465	465	585	424
16	2,160	3,660	6,070	6,020	7,400	10,200	2,820	585	465	465	1,120	410
17	1,810	3,490	6,280	6,250	6,200	10,800	2,680	585	465	465	720	555
18	1,700	3,490	6,070	6,500	7,900	12,000	2,540	585	438	465	650	495
19	1,700	3,170	6,280	7,150	6,500	9,700	2,160	585	410	465	585	555
20	19,000	3,020	6,750	6,900	6,700	9,400	1,810	525	410	452	585	525
21	11,200	2,870	7,200	6,900	8,140	8,880	1,600	525	410	438	585	495
22	4,200	2,730	7,770	7,650	9,460	7,660	1,400	525	410	424	555	480
23	3,240	2,590	7,770	9,150	10,600	6,460	1,210	525	410	410	525	465
24	23,600	2,460	8,130	10,000	9,200	5,600	1,210	525	410	410	525	465
25	18,300	2,340	8,450	12,800	8,400	5,200	1,120	525	410	410	525	465
26	12,600	2,110	7,900	14,000	7,640	5,000	1,040	525	465	438	525	495
27	8,270	2,220	7,160	11,400	7,900	6,000	950	495	525	585	525	525
28	8,730	2,000	7,640	8,640	8,520	5,800	950	465	465	495	525	650
29	15,600	.....	9,000	7,150	9,140	5,200	870	465	465	480	525	585
30	34,800	.....	10,800	7,400	9,140	4,800	870	465	465	465	525	585
31	39,000	.....	12,600	.....	9,420	.....	870	465	.....	465	.....	585

NOTE.—Daily discharge determined from rating curves fairly well defined at medium and low stages applicable Jan. 1 to 31, Feb. 1 to Mar. 7, and July 1 to Dec. 31. Discharge Feb. 12 estimated by means of record of discharge from the adjacent drainage areas. Daily discharge Mar. 8 to June 30 determined by indirect method for shifting channels. Discharge interpolated for days in July and December on which gage was not read.

Monthly discharge of Yuba River near Smartsville, Cal., for 1911.

[Drainage area, 1,220 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	39,000	466	7,840	6.43	7.41	482,000	B.
February	19,700	2,000	6,840	5.61	5.84	380,000	B.
March	23,000	2,460	8,680	7.11	8.20	534,000	C.
April	23,400	5,800	10,900	8.93	9.96	649,000	C.
May	13,700	6,200	8,560	7.02	8.09	526,000	B.
June	14,600	4,800	9,490	7.78	8.68	565,000	B.
July	5,000	870	2,590	2.12	2.44	159,000	B.
August	795	465	608	.498	.57	37,400	A.
September	525	410	453	.371	.41	27,000	A.
October	585	410	476	.390	.45	29,300	A.
November	2,410	410	618	.507	.57	36,800	A.
December	650	410	500	.410	.47	30,700	A.
The year	39,000	410	4,770	3.91	53.09	3,460,000	

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OREGON CREEK NEAR NORTH SAN JUAN, CAL.

Location.—Below highway bridge in the N. ½ SE. ¼ sec. 28, T. 18 N., R. 8 E., in the Tahoe National Forest, 500 feet above the mouth, half a mile above Freemans Bridge, and 2 miles northeast of North San Juan.

Records available.—October 28, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to an alder tree on right bank 150 feet below bridge.

Channel.—Small bowlders and gravel and shifts at high stages.

Discharge measurements.—Made from bridge or by wading near gage. As the bridge section is rough, a car and cable were installed on November 8, 1911, 30 feet below gage.

Cooperation.—Gage height record furnished by United States Forest Service until August 21, 1911.

Estimates are withheld until high-water measurements are made at the cable section.

Discharge measurements of Oregon Creek near North San Juan, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 25[a]	G. T. Peekema	5.25	291
June 13[b]	do	4.40	51
Nov. 8[c]	do	4.01	8.9

[a] Measurement from highway bridge, 600 feet above mouth of creek.
[b] Measurement by wading 200 feet below gage.
[c] Measurement by wading 150 feet above mouth.

Daily gage height, in feet, of Oregon Creek near North San Juan, Cal., for 1911.

[C. E. Whittum and H. Zurhorst, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	6.0	.....	.....	.....	.....	.....	.....	.....	3.9	3.9	4.0
2	.....	5.7	4.5	.....	.....	.....	.....	3.9	3.8	3.9	3.9	4.0
3	.....	5.5	.....	7.5	.....	.....	.....	.....	3.8	3.9	3.9	4.0
4	.....	5.5	5.0	.....	.....	.....	.....	.....	3.8	3.9	3.9	4.0
5	.....	5.4	5.4	.....	.....	.....	.....	.....	3.8	4.0	3.9	3.9
6	.....	.....	5.8	.....	5.15	.....	.....	.....	3.8	4.0	3.9	3.9
7	.....	5.3	6.1	.....	.....	4.7	4.1	.....	3.8	3.9	3.9	4.0
8	.....	.....	5.8	.....	.....	.....	.....	.....	3.8	3.9	3.9	3.9
9	.....	4.9	5.6	.....	.....	.....	.....	.....	3.8	3.9	4.1	3.9
10	.....	.....	5.5	.....	.....	.....	.....	.....	3.8	4.0	4.7	3.9
11	.....	4.9	5.5	.....	.....	.....	.....	.....	3.8	3.9	4.2	3.9
12	.....	4.8	.....	.....	.....	.....	.....	.....	3.8	3.9	4.1	3.9
13	.....	4.9	.....	.....	5.1	4.4	.....	.....	3.8	3.9	4.0	3.9
14	.....	.....	.....	.....	.....	.....	4.0	.....	3.8	3.9	4.1	3.9
15	.....	4.7	5.3	.....	.....	.....	.....	.....	3.8	3.9	4.1	3.9
16	.....	.....	5.2	.....	.....	.....	.....	.....	3.8	3.9	4.3	3.9
17	.....	.....	5.2	5.4	.....	4.3	.....	.....	3.8	3.9	4.0	4.0
18	.....	4.6	5.0	.....	.....	.....	.....	.....	3.8	3.9	4.1	4.0
19	4.3	4.6	.....	.....	6.05	.....	.....	.....	3.8	3.9	4.1	4.0
20	6.6	.....	.....	.....	.....	.....	.....	.....	3.8	3.9	4.0	4.0
21	5.5	4.5	.....	.....	.....	.....	.....	3.9	3.8	3.9	4.0	4.0
22	5.0	4.5	.....	.....	.....	.....	.....	3.9	3.8	3.9	4.0	4.0
23	4.7	.....	.....	.....	.....	.....	.....	3.9	3.8	3.9	4.0	4.0
24	6.4	.....	.....	.....	5.8	.....	3.9	3.9	3.8	3.9	4.0	4.0
25	6.2	.....	.....	5.25	5.8	.....	.....	3.9	3.8	3.9	4.0	3.9
26	5.5	.....	.....	.....	.....	4.2	.....	3.9	3.9	3.9	4.0	3.9
27	5.2	4.4	.....	.....	.....	.....	.....	3.9	3.9	4.0	3.9	3.9
28	5.3	.....	.....	.....	.....	.....	.....	3.9	3.9	3.9	3.9	4.0
29	6.1	.....	.....	.....	.....	4.2	.....	3.9	3.9	3.9	3.9	4.0
30	6.85	.....	.....	.....	.....	.....	.....	.....	3.9	3.9	4.0	4.0
31	6.75	.....	5.5	.....	.....	.....	.....	3.8	.....	3.9	.....	4.0

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NORTH FORK OF YUBA RIVER[1] NEAR SIERRA CITY, CAL.

Location.—At footbridge 1½ miles west of Sierra City, in the Tahoe National Forest, 2½ miles below junction of North and South forks of North Fork of Yuba River.
Records available.—November 1 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to upstream end of left abutment of footbridge.
Channel.—Bowlders and gravel.
Discharge measurements.—Made from footbridge or by wading.
Cooperation.—Gage-height record and discharge measurement furnished by United States Forest Service.

The following discharge measurement was made by G. T. Peekema:
November 1, 1911: Gage height, 1.95 feet; discharge, 89 second-feet.

Daily gage height, in feet, of North Fork of Yuba River near Sierra City, Cal., for 1911.

[A. H. Walton, observer.]

Date.	Nov.	Dec.	Date.	Nov.	Dec.	Date.	Nov.	Dec.
1	1.95		11			21		
2		2.0	12			22		
3			13	2.75		23		
4		2.1	14			24		
5	2.3		15			25	2.3	
6			16			26		
7			17			27		
8			18			28		
9			19			29		
10	2.0		20			30	2.35	
						31		

NORTH FORK OF YUBA RIVER[1] AT GOODYEAR BAR, CAL.

Location.—At highway bridge at Goodyear Bar, in the E. ½ SW. ¼ sec. 5, T. 19 N., R. 10 E., in the Tahoe National Forest. North Fork of North Fork of Yuba River enters at Downieville, 4 miles above, and Rock Creek and Goodyear Creek one-eighth and one-fourth mile, respectively, below the station.
Records available.—October 31, 1910, to December 31, 1911.
Drainage area.—214 square miles.
Gage.—Vertical staff in two sections on left bank. Low-water section is fastened to old piling under bridge, while remainder of gage is bolted to downstream end of bridge pier.
Channel.—Solid rock, small bowlders, and gravel; appears permanent.
Discharge measurements.—Made from downstream side of bridge.
Accuracy.—Results are good.
Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

[1] Known locally as North Yuba River.

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Discharge measurements of North Fork of Yuba River at Goodyear Bar, Cal., 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 13	Fred G. Wood	3.98	390
23	do	3.97	395
25	do	5.12	1,200
26	do	4.45	697
27	do	4.25	507
Apr. 23	G. T. Peekema	5.78	1,940
June 15	do	6.80	3,170
Nov. 3	do	3.46	173

Daily gage height, in feet, of North Fork of Yuba River at Goodyear Bar, Cal., for 1911.

[W. S. Barton and G. E. King, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.5	7.1	3.7	6.0	5.8	6.6	5.7	4.0	3.6	3.5	3.45	.....
2	3.5	6.8	3.6	6.5	5.8	6.8	5.5	4.0	3.6	3.5	3.45	3.45
3	3.5	6.2	3.8	6.7	6.1	7.0	5.6	3.95	3.6	3.5	3.45	3.45
4	3.5	5.8	4.0	6.5	6.2	6.9	5.45	3.9	3.6	3.6	3.45	3.45
5	3.5	4.6	4.0	6.6	6.4	.....	5.55	3.9	3.6	.....	3.45	.....
6	3.5	4.0	4.0	6.7	6.0	.....	5.4	3.9	.....	3.55	3.45	3.4
7	3.65	3.8	4.3	6.5	5.9	7.1	5.3	3.9	3.6	3.55	3.45	3.4
8	3.7	3.5	4.3	6.5	5.85	7.2	5.25	3.85	.....	3.55	3.45	3.4
9	3.8	3.5	4.3	6.0	5.8	7.3	5.15	.....	3.6	3.55	3.55	3.4
10	3.7	3.6	4.9	6.0	5.75	7.8	5.0	3.8	3.6	3.55	4.0	3.4
11	3.65	3.5	5.0	5.9	6.0	7.2	5.0	3.8	3.6	.....	3.55	3.4
12	3.7	3.5	5.2	5.7	6.1	7.5	4.9	3.8	3.6	3.5	.....	3.4
13	4.0	3.5	5.0	6.1	6.0	7.7	4.85	3.8	3.6	3.5	3.5	3.4
14	3.8	3.6	4.6	5.8	5.9	7.6	4.8	3.8	3.55	3.5	3.5	3.4
15	3.6	3.5	4.6	5.5	5.85	7.4	.....	3.8	3.55	3.5	3.7	3.4
16	3.5	3.5	4.3	5.5	5.8	7.6	4.8	3.8	3.5	3.5	3.65	3.4
17	3.6	3.7	4.3	5.4	.....	.....	4.7	3.75	3.5	.....	3.55	3.4
18	3.8	3.6	4.6	5.4	5.75	.....	4.6	3.75	.....	3.5	3.5	3.4
19	3.7	3.5	4.6	5.5	5.6	7.5	4.6	3.75	3.5	3.5	3.5	3.4
20	4.8	3.5	4.6	5.5	5.9	7.1	4.5	.....	3.5	3.5	3.55	3.35
21	4.5	3.5	4.9	5.5	6.2	6.8	4.8	.....	3.5	3.5	3.5	3.35
22	3.8	3.5	5.0	5.5	6.3	6.5	.....	.....	3.5	3.5	3.5	3.35
23	4.0	3.5	5.0	5.8	6.9	6.2	4.4	3.7	3.5	3.5	3.45	3.35
24	4.6	3.5	5.1	5.9	6.4	6.0	4.3	.....	3.5	3.5	3.45	.....
25	4.3	3.5	5.1	6.0	6.2	5.85	4.25	3.7	3.5	3.5	3.45	3.3
26	3.8	3.5	5.2	6.1	6.1	6.3	4.2	3.7	3.55	3.45	3.45	3.3
27	4.15	3.6	5.5	6.0	6.2	6.1	4.2	.....	3.6	.....	3.45	3.45
28	4.5	3.5	5.8	6.0	6.3	6.0	4.1	.....	3.55	.....	3.5	3.5
29	7.5	.....	5.8	6.2	6.6	5.9	4.1	3.7	3.5	.....	3.5	3.45
30	7.5	.....	6.0	6.0	6.4	5,8	4.1	3.65	3.5	3.45	3.45	3.45
31	7.6	.....	6.0	.....	6.3	.....	4.0	.....	.....	3.45	.....	3.45

Daily discharge, in second-feet, of North Fork of Yuba River at Goodyear Bar, Cal., for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
	1910.			1910.			1910.	
1	150	567	11	184	1,400	21	220	330
2	150	983	12	184	715	22	220	305
3	150	1,300	13	184	405	23	520	305
4	150	969	14	184	405	24	445	305
5	150	637	15	184	355	25	370	282
6	167	305	16	184	355	26	295	260
7	172	305	17	202	355	27	220	260
8	177	405	18	202	355	28	197	282
9	202	790	19	220	330	29	173	260
10	184	865	20	220	330	30	150	260
						31	.....	260

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Daily discharge, in second-feet, of North Fork of Yuba River at Goodyear Bar, Cal., for 1910–11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	184	3 580	260	2,170	1,930	2,920	1,820	405	220	184	167	167
2	184	3,180	220	2,790	1,930	3,180	1,600	405	220	184	167	167
3	184	2,410	305	3,050	2 290	3,440	1,710	380	220	184	167	167
4	184	1,930	405	2,790	2,410	3,310	1 550,	355	220	220	167	167
5	184	790	405	2,920	2,660	3,400	1,660	355	220	211	167	158
6	184	405	405	3,050	2,170	3,490	1,500	355	220	202	167	150
7	240	305	580	2,790	2,050	3,580	1,400	355	220	202	167	150
8	260	184	580	2,790	1,990	3,720	1,350	330	220	202	167	150
9	305	184	580	2,170	1,930	3,860	1,260	318	220	202	202	150
10	260	220	1,030	2,170	1,880	4,570	1,120	305	220	202	405	150
11	240	184	1,120	2,050	2,170	3,720	1,120	305	220	193	202	150
12	260	184	1,300	1,820	2,290	4,140	1,030	305	220	184	193	150
13	405	184	1,120	2,290	2,170	4,420	988	305	220	184	184	150
14	305	220	790	1,930	2,050	4,280	945	305	202	184	184	150
15	220	184	790	1,600	1,990	4,000	945	305	202	184	260	150
16	184	184	580	1,600	1,930	4,280	945	305	184	184	240	150
17	220	260	580	1,500	1,900	4,230	865	282	184	184	202	150
18	305	220	790	1,500	1,880	4,190	790	282	184	184	184	150
19	260	184	790	1,600	1,710	4,140	790	282	184	184	184	150
20	945	184	790	1,600	2,050	3,580	715	276	184	184	202	135
21	715	184	1,030	1,600	2,410	3,180	945	270	184	184	184	135
22	305	184	1,120	1,600	2,530	2,790	790	265	184	184	184	135
23	405	184	1,120	1,930	3,310	2,410	645	260	184	184	167	135
24	790	184	1,210	2,050	2,660	2,170	580	260	184	184	167	128
25	580	184	1,210	2,170	2,410	1,990	550	260	184	184	167	120
26	305	184	1,300	2,290	2,290	2,530	520	260	202	167	167	120
27	490	220	1,600	2,170	2,410	2,290	520	260	220	167	167	167
28	715	184	1,930	2,170	2,530	2,170	460	260	202	167	184	184
29	4,140	.....	1,930	2,410	2,920	2,050	460	260	184	167	184	167
30	4,140	.....	2,170	2,170	2,660	1,930	460	240	184	167	167	167
31	4,280	.....	2,170	.....	2,530	.....	405	230	.....	167	.....	167

NOTE.—Daily discharge 1910-11 determined from a well-defined rating curve. Discharge interpolated for days on which gage was not read.

Monthly discharge of North Fork of Yuba River at Goodyear Bar, Cal., for 1910–11.

[Drainage area, 214 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
November	520	150	214	1.00	1.12	12,700	A.
December	1,400	260	482	2.25	2.59	29,600	A.
1911.							
January	4,280	184	723	3.38	3.90	44,500	A.
February	3,580	184	596	2.79	2.90	33,100	A.
March	2,170	220	975	4.56	5.26	60,000	A.
April	3,050	1,500	2,160	10.1	11.27	129,000	A.
May	3,310	1,710	2,260	10.6	12.22	139,000	A.
June	4,570	1,930	3,330	15.6	17.40	198,000	A.
July	1,820	405	982	4.59	5.29	60,400	A.
August	405	230	301	1.41	1.63	18,500	A.
September	220	184	203	.949	1.06	12,100	A.
October	220	167	186	.869	1.00	11,400	A.
November	405	167	191	.893	1.00	11,400	A.
December	184	120	151	.706	.81	9,280	A.
The year	4,570	120	1,000	4.67	63.74	727,000	

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NORTH FORK OF NORTH FORK OF YUBA RIVER[1] AT DOWNIEVILLE, CAL.

Location.—At upper highway bridge in Downieville, in the NE. ¼ NW. ¼ sec. 35, T. 20 N., R. 10 E., 500 feet above dam and one-fourth mile above junction with North Fork of Yuba River. Middle Fork of North Fork enters 1¼ miles above and East Fork of North Fork one-eighth mile above the station.

Records available.—November 1, 1910, to December 31, 1911.

Drainage area.—71.2 square miles.

Gage.—Vertical staff fastened to stream face of right abutment of bridge.

Channel.—Gravel and small bowlders and appears permanent.

Discharge measurements.—Usually made from bridge just above mouth.

Winter flow.—Some ice in stream during November and December, 1911. It is believed that the ice affected the discharge but little and no correction has been applied.

Diversions.—The intake of the municipal water system of Downieville is above the station.

Accuracy.—Gage-height record is considered very reliable and rating curve is well defined. Results are excellent.

Cooperation.—Gage-height record furnished by John T. Mason.

Discharge measurements of North Fork of North Fork of Yuba River at Downieville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 16	Fred G. Wood	2.91	107
20	....do	3.74	541
21	....do	3.3	241
22	....do	3.11	172
Apr. 2	G. T. Peekema	4.28	930
June 15	....do	4.60	1,260
Nov. 2	....do	2.73	69

Daily gage height, in feet, of North Fork of North Fork of Yuba River at Downieville, Cal., for 1911.

[J. T. Mason, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.75	3.85	3.0	4.55	4.0	4.4	3.8	3.2	2.8	2.8	2.75	2.65
2	2.75	3.8	3.0	4.7	4.0	4.55	3.7	3.1	2.8	2.75	2.74	2.67
3	2.7	3.6	3.1	4.65	4.05	4.75	3.7	3.1	2.8	2.75	2.75	2.6
4	2.7	3.6	3.05	4.45	4.45	4.65	3.7	3.1	2.8	2.85	2.75	2.65
5	2.7	3.6	3.45	4.6	4.45	4.8	3.7	3.1	2.8	2.8	2.75	2.67
6	2.7	3.6	3.55	4.85	4.35	4.55	3.7	3.0	2.8	2.8	2.75	2.67
7	2.7	3.6	3.7	4.45	4.25	4.6	3.6	3.0	2.8	2.8	2.75	2.7
8	2.7	3.5	3.65	4.4	4.1	4.6	3.6	3.0	2.8	2.8	2.75	2.7
9	2.9	3.4	3.6	4.4	4.1	4.6	3.6	3.0	2.8	2.8	2.8	2.7
10	2.85	3.3	3.4	4.2	4.05	4.75	3.5	3.0	2.8	2.8	2.8	2.7
11	2.75	3.3	3.5	4.0	4.2	4.95	3.5	3.0	2.8	2.8	2.8	2.6
12	2.7	3.2	3.4	3.9	4.25	4.75	3.5	3.0	2.8	2.8	2.8	2.65
13	3.1	3.15	3.4	3.8	4.3	4.7	3.4	3.0	2.8	2.8	2.7	2.65
14	3.0	3.0	3.4	3.75	4.05	4.55	3.4	3.0	3.8	2.8	2.7	2.65
15	3.0	2.9	3.4	3.7	4.05	4.5	3.5	3.0	2.8	2.8	2.8	2.65
16	2.9	3.0	3.4	3.7	4.0	4.6	3.3	2.9	2.8	2.75	2.7	2.65
17	2.9	3.1	3.4	3.7	4.05	4.5	3.4	2.9	2.8	2.75	2.75	2.65
18	2.85	3.1	3.4	3.75	4.0	4.8	3.4	2.9	2.8	2.75	2.75	2.65
19	2.9	3.1	3.55	3.9	4.0	4.8	3.4	2.9	2.8	2.75	2.75	2.65
20	3.7	3.1	3.6	3.8	4.0	4.5	3.4	2.9	2.8	2.75	2.8	2.65

[1] Known locally as North Fork of North Yuba River.

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Daily gage height, in feet, of North Fork of North Fork of Yuba River at Downieville, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	3.2	3.1	3.6	3.85	4.15	4.4	3.4	2.9	2.8	2.75	2.8	2.65
22	3.1	3.05	3.65	3.95	4.35	4.2	3.2	2.9	2.8	2.75	2.8	2.65
23	3.05	3.05	3.7	4.1	4.55	4.1	3.2	2.9	2.8	2.75	2.8	2.65
24	3.4	3.05	3.75	4.35	4.3	4.1	3.2	2.9	2.8	2.75	2.75	2.63
25	3.5	3.0	3.8	4.45	4.25	4.0	3.2	2.9	2.8	2.75	2.7	2.6
26	3.4	3.0	3.8	4.5	4.1	4.2	3.2	2.9	2.8	2.75	2.7	2.6
27	3.2	3.0	3.8	4.35	4.3	4.2	3.2	2.9	2.8	2.75	2.7	.....
28	3.1	3.0	3.8	4.15	4.3	4.0	3.2	2.9	2.8	2.75	2.67	2.6
29	3.9	.....	3.9	4.05	4.4	4.0	3.2	2.9	2.8	2.75	2.65	2.65
30	5.4	.....	4.05	4.1	4.4	4.0	3.2	2.9	2.8	2.75	2.65	2.65
31	4.55	.....	4.25	.....	4.35	.....	3.2	2.8	.....	2.75	.....	2.65

Daily discharge, in second-feet, of North Fork of North Fork of Yuba River at Downieville, Cal., for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1	52	57	11	78	550	21	42	103
2	52	57	12	125	300	22	42	103
3	57	515	13	68	205	23	355	90
4	57	228	14	50	185	24	130	90
5	50	148	15	50	148	25	165	90
6	52	130	16	54	148	26	130	86
7	52	130	17	42	148	27	78	78
8	78	275	18	96	140	28	57	78
9	65	428	19	63	130	29	57	78
10	57	385	20	42	103	30	57	78
						31	.....	72

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	68	585	130	1,200	690	1,050	550	205	78	78	68	50
2	68	550	130	1,380	690	1,200	480	165	78	68	65	52
3	57	415	165	1,320	730	1,440	480	165	78	68	68	42
4	57	415	148	1,100	1,100	1,320	480	165	78	90	68	50
5	57	415	328	1,260	1,100	1,500	480	165	78	78	68	52
6	57	415	385	1,560	1,000	1,200	480	130	78	78	68	52
7	57	415	480	1,100	905	1,260	415	130	78	78	68	57
8	57	355	448	1,050	770	1,260	415	130	78	78	68	57
9	103	300	415	1,050	770	1,260	415	130	78	78	78	57
10	90	250	300	860	730	1,440	355	130	78	78	78	57
11	68	250	355	690	860	1,680	355	130	78	78	78	42
12	57	205	300	620	905	1,440	355	130	78	78	78	50
13	165	185	300	550	950	1,380	300	130	78	78	57	50
14	130	130	300	415	730	1,200	300	130	78	78	57	50
15	130	103	300	480	730	1,150	355	130	78	78	78	50
16	103	130	300	480	690	1,260	250	103	78	68	57	50
17	103	165	300	480	730	1,150	300	103	78	68	68	50
18	90	165	300	415	690	1,500	300	103	78	68	68	50
19	103	165	385	620	690	1,500	300	103	78	68	68	50
20	480	165	415	550	690	1,150	300	103	78	68	78	50
21	205	165	415	585	815	1,050	300	103	78	68	78	50
22	165	148	448	655	1,000	860	205	103	78	68	78	50
23	148	148	480	770	1,200	770	205	103	78	68	78	50
24	300	148	515	1,000	950	770	205	103	78	68	68	46
25	355	130	550	1,100	905	690	205	103	78	68	57	42
26	300	130	550	1,150	770	860	205	103	78	68	57	42
27	205	130	550	1,000	950	860	205	103	78	68	57	42
28	165	130	550	815	950	690	205	103	78	68	52	42
29	620	.....	620	730	1,050	690	205	103	78	68	50	50
30	2,290	.....	730	770	1,050	690	205	103	78	68	50	50
31	1,200	.....	905	.....	1,000	.....	205	78	.....	68	.....	50

NOTE.—Daily discharge determined from a well-defined rating curve.

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Monthly discharge of North Fork of North Fork of Yuba River at Downieville, Cal., for 1910–11.

[Drainage area, 71.2 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
November	355	42	78.4	1.10	1.23	4,670	A.
December	515	57	173	2.43	2.80	10,600	A.
1911.							
January	2,290	57	260	3.65	4.21	16,000	A.
February	585	103	247	3.47	3.61	13,700	A.
March	905	130	403	5.66	6.52	24,800	A.
April	1,560	415	858	12.1	13.50	51,100	A.
May	1,200	690	864	12.1	13.95	53,100	A.
June	1,680	690	1,140	16.0	17.85	67,800	A.
July	550	205	323	4.54	5.23	19,900	A.
August	205	78	122	1.71	1.97	7,500	A.
September	78	78	78.0	1.10	1.23	4,640	A.
October	90	68	72.6	1.02	1.18	4,460	A.
November	78	50	67.0	.941	1.05	3,990	A.
December	57	42	49.4	.694	.80	3,040	A.
The year	2,290	42	373	5.24	71.10	270,000	

ROCK CREEK AT GOODYEAR BAR, CAL.

Location.—At the footbridge at Goodyear Bar, in the W. ½ SW. ¼ sec. 5, T. 19 N., R. 10 E., in the Tahoe National Forest. Woodruff Creek enters 350 feet above and Rock Creek joins the North Fork of Yuba River 600 feet below the station.

Records available.—October 30, 1910, to December 31, 1911.

Drainage area.—10.8 square miles.

Gage.—Vertical staff fastened to an alder tree on right bank 40 feet below bridge.

Channel.—Bowlders and gravel, and is rough. Section appears permanent.

Discharge measurements.—Made from bridge at high stages and by wading at low stages.

Diversions.—Three small ditches, having a total capacity of about 10 second-feet, head above the station.

Accuracy.—Results are fairly good.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of Rock Creek at Goodyear Bar, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 13	Fred G. Wood	3.06	29
25	....do	4.32	182
26	....do	3.7	106
27	....do	3.39	52
Apr. 23	G. T Peekema	3.79	112
June 14[a]	....do	3.15	43
Nov. 3[b]	....do	2.20	1.7

[a] Measurement made by wading. [b] Measurement made by wading 50 feet above bridge.

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Daily gage height, in feet, of Rock Creek at Goodyear Bar, Cal., for 1911.

[W. S. Barton, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.5	5.4	2.6	4.2	4.2	3.5	2.55	2.2	2.0	2.2	2.2	.....
2	2.5	5.2	2.7	4.6	3.9	3.55	2.6	2.05	2.0	2.2	2.2	2.3
3	2.45	5.0	2.9	4.9	3.8	3.6	2.5	2.05	2.05	2.2	2.2	2.25
4	2.45	4.5	3.0	4.6	3.7	3.5	2.45	2.1	2.05	2.3	2.2	2.25
5	2.4	3.6	3.0	4.6	4.0	.....	2.5	2.1	2.1	.....	2.2	.....
6	2.4	2.8	3.0	4.7	3.8	.....	2.45	2.1	.....	2.3	2.2	2.25
7	2.4	2.5	3.2	4.5	3.7	3.5	2.45	2.15	2.1	2.3	2.2	2.25
8	2.7	2.5	3.4	4.2	3.7	3.45	2.4	2.1	.....	2.25	2.2	2.25
9	2.6	2.5	3.4	4.0	3.7	3.4	2.45	.....	2.05	2.25	2.3	2.2
10	2.7	2.6	3.8	4.1	3.6	3.4	2.45	2.05	2.05	2.25	2.8	2.2
11	2.55	2.5	3.8	4.0	3.7	3.3	2.4	2.05	.....	.....	2.35	2.2
12	2.75	2.5	4.0	4.0	3.8	3.3	2.4	2.05	2.05	2.2	.....	2.2
13	3.2	2.6	3.6	4.3	3.7	3.3	2.4	2.05	2.05	2.2	2.3	2.2
14	2.9	2.6	3.5	4.0	3.65	3.2	2.3	2.0	2.05	2.2	2.3	2.25
15	2.8	2.5	3.2	3.9	3.6	3.1	.....	2.0	2.1	2.2	2.65	2.25
16	2.7	2.6	3.0	3.8	3.55	3.05	2.25	2.0	2.1	2.2	2.45	2.25
17	2.8	2.6	3.0	3.7	.....	.....	2.3	2.0	2.1	.....	2.85	2.25
18	2.8	2.6	3.1	3.7	3.7	.....	2.25	2.0	.....	2.2	2.3	2.25
19	2.9	2.5	2.9	3.8	3.6	2.9	2.25	2.0	2.1	2.2	2.3	2.25
20	4.2	2.5	2.9	4.0	3.7	2.8	.....	.....	2.05	2.2	2.35	2.25
21	3.8	2.5	2.9	4.4	3.8	2.8	2.25	.....	2.05	2.2	2.3	2.25
22	3.4	2.5	3.0	4.7	3.7	2.75	.....	.....	2.1	2.2	2.3	2.25
23	2.8	2.6	3.0	4.9	3.8	2.75	2.25	2.0	2.1	2.2	2.25	2.25
24	5.0	2.5	2.8	5.0	3.7	2.75	2.3	.....	2.1	2.2	2.3	.....
25	4.8	2.5	2.8	5.4	3.6	2.7	2.3	2.0	2.1	2.2	.....	2.2
26	4.3	2.5	3.0	5.9	3.55	2.7	2.25	2.0	2.2	2.2	2.3	2.25
27	4.0	2.5	3.1	5.4	3.5	2.6	2.2	.....	2.25	.....	2.3	2.3
28	3.8	2.6	3.3	5.0	3.5	2.65	2.3	.....	2.2	.....	2.3	2.3
29	6.0	.....	3.6	4.7	3.6	2.65	2.2	2.0	2.2	.....	2.3	2.25
30	6.0	.....	4.0	4.6	3.5	2.6	2.3	2.0	2.2	2.2	2.3	2.25
31	5.8	.....	4.2	.....	3.5	.....	2.2	.....	.....	2.2	.....	2.25

Daily discharge, in second-feet, of Rock Creek at Goodyear Bar, Cal., for 1910–11.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1910.				1910.				1910.			
1	.....	3.2	2.5	11	.....	7	52	21	.....	7	8.5
2	.....	3.2	2.5	12	.....	6	19	22	.....	7	7
3	.....	3.2	62	13	.....	6	19	23	.....	5	7
4	.....	3.5	43	14	.....	6	14	24	.....	4	7
5	.....	3.5	24	15	.....	6	14	25	.....	4	6
6	.....	3.5	5	16	.....	6	10	26	.....	4	5
7	.....	3.5	5	17	.....	7	10	27	.....	3.5	5
8	.....	5	5	18	.....	7	10	28	.....	3	5
9	.....	6	7	19	.....	7	8.5	29	.....	3	5
10	.....	7	10	20	.....	7	8.5	30	3.2	2.5	5
								31	3.2	.....	5

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Daily discharge, in second-feet, of Rock Creek at Goodyear Bar, Cal., for 1910–11—Contd.

Day.	Jan.	Feb.	Mar.	Apr	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	5	399	7	168	168	72	6	1.7	0.5	1.7	1.7	2.5
2	5	354	10	235	122	78	7	.8	.5	1.7	1.7	2.5
3	4.2	312	19	291	108	83	5	.8	.8	1.7	1.7	2.1
4	4.2	218	26	235	95	72	4.2	1.0	.8	2.5	1.7	2.1
5	3.5	83	26	235	137	72	5	1.0	1.0	2.5	1.7	2.1
6	3.5	14	26	253	108	72	4.2	1.0	1.0	2.5	1.7	2.1
7	3.5	5	43	218	95	72	4.2	1.4	1.0	2.5	1.7	2.1
8	10	5	62	168	95	67	3.5	1.0	.9	2.1	1.7	2.1
9	7	5	62	137	95	62	4.2	.9	.8	2.1	2.5	1.7
10	10	7	108	152	83	62	4.2	.8	.8	2.1	14	1.7
11	6	5	108	137	95	52	3.5	.8	.8	1.9	3.0	1.7
12	12	5	137	137	108	52	3.5	.8	.8	1.7	2.8	1.7
13	43	7	83	184	95	52	3.5	.8	.8	1.7	2.5	1.7
14	19	7	72	137	89	43	2.5	.5	.8	1.7	2.5	2.1
15	14	5	43	122	83	34	2.3	.5	1.0	1.7	8.5	2.1
16	10	7	26	108	78	30	2.1	.5	1.0	1.7	4.2	2.1
17	14	7	26	95	86	26	2.5	.5	1.0	1.7	16	2.1
18	14	7	34	95	95	22	2.1	.5	1.0	1.7	2.5	2.1
19	19	5	19	108	83	19	2.1	.5	1.0	1.7	2.5	2.1
20	168	5	19	137	95	14	2.1	.5	.8	1.7	3.0	2.1
21	108	5	19	201	108	14	2.1	.5	.8	1.7	2.5	2.1
22	62	5	26	253	95	12	2.1	.5	1.0	1.7	2.5	2.1
23	14	7	26	291	108	12	2.1	.5	1.0	1.7	2.1	2.1
24	312	5	14	312	95	12	2.5	.5	1.0	1.7	2.5	1.9
25	272	5	14	399	83	10	2.5	.5	1.0	1.7	2.5	1.7
26	184	5	26	520	78	10	2.1	.5	1.7	1.7	2.5	2.1
27	137	5	34	399	72	7	1.7	.5	2.1	1.7	2.5	2.5
28	108	7	52	312	72	8.5	2.5	.5	1.7	1.7	2.5	2.5
29	545	.....	83	253	83	8.5	1.7	.5	1.7	1.7	2.5	2.1
30	545	.....	137	235	72	7	2.5	.5	1.7	1.7	2.5	2.1
31	495	.....	168	.....	72	.....	1.7	.5	.....	1.7	.....	2.1

NOTE.—Daily discharge 1910–11 determined from a rating curve well defined below 300 second-feet. Discharge interpolated for days on which gage was not read; discharge Dec. 1 and 2, 1910, estimated.

Monthly discharge of Rock Creek at Goodyear Bar, Cal., for 1910–11.

[Drainage area, 10.8 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
November	7	2.5	4.99	0.462	0.52	297	D.
December	62	2.5	12.8	1.19	1.37	787	C.
1911.							
January	545	3.5	102	9.44	10.88	6,270	B.
February	399	5	53.8	4.98	5.19	2,990	B.
March	168	7	50.2	4.65	5.36	3,090	B.
April	520	95	218	20.2	22.54	13,000	B.
May	168	72	95.2	8.81	10.16	5,850	B.
June	83	7	38.6	3.57	3.98	2,300	C.
July	7	1.7	3.14	.291	.34	193	D.
August	1.7	.5	.70	.065	.07	43	D.
September	2.1	.5	1.03	.095	.11	61	D.
October	2.5	1.7	1.85	.171	.20	114	D.
November	16.	1.7	3.41	.316	.35	203	D.
December	2.5	1.7	2.07	.192	.22	127	D.
The year	545	.5	47.2	4.37	59.40	34,200	

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GOODYEAR CREEK AT GOODYEAR BAR, CAL.

Location.—At trail bridge, in the W. ½ SW. ¼ sec. 5, T. 19 N., R. 10 E., in the Tahoe National Forest, 300 feet above junction with North Fork of Yuba River and half a mile north of Goodyear Bar.

Records available.—October 30, 1910, to December 31, 1911.

Drainage area.—12.2 square miles.

Gage.—Vertical staff fastened to an alder tree on left bank 200 feet above bridge.

Channel.—Solid rock and gravel; appears permanent.

Discharge measurements.—Made from bridge or by wading.

Diversions.—Three small irrigation ditches, having a total capacity of about 7½ second-feet, head above the station.

Accuracy.—Rating curve is well defined at low and medium stages and results are excellent. The high water record is approximate.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of Goodyear Creek at Goodyear Bar, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 13	Fred G. Wood	1.98	30
25	do	3.2	174
26	do	2.65	102
27	do	2.37	68
Apr. 23	G. T. Peekema	3.15	167
June 15	do	2.25	54
Nov. 3	do	1.51	7.0

Daily gage height, in feet, of Goodyear Creek at Goodyear Bar, Cal., for 1911.

[W. S. Barton, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.6	5.0	3.5	3.8	3.0	2.75	1.75	1.55	1.5	1.5	1.5	.....
2	1.6	4.8	3.9	3.9	3.0	2.85	1.8	1.55	1.5	1.5	1.5	1.5
3	1.6	4.2	4.1	4.2	2.8	2.8	1.8	1.55	1.5	1.45	1.5	1.5
4	1.6	4.0	4.8	4.0	2.7	2.7	1.75	1.55	1.5	1.5	1.5	1.5
5	1.6	3.8	5.0	3.9	3.4	.....	1.75	1.55	1.5	.....	1.5	.....
6	1.6	3.0	5.0	3.9	3.1	.....	1.7	1.5	.....	1.5	1.5	1.5
7	1.6	2.9	5.2	3.6	3.05	2.7	1.7	1.5	1.5	1.5	1.5	1.5
8	1.7	2.8	5.2	3.5	3.0	2.75	1.75	1.5	.....	1.5	1.5	1.5
9	1.9	2.8	5.0	3.4	3.0	2.7	1.75	.....	1.5	1.5	1.55	1.5
10	1.9	2.8	4.9	3.5	3.35	2.7	1.7	1.5	1.5	1.5	2.05	1.5
11	1.9	2.4	4.9	3.4	3.65	2.45	1.7	1.5	1.5	.....	1.6	1.5
12	1.9	2.4	5.0	3.5	3.15	2.5	1.7	1.5	1.5	1.5	.....	1.5
13	1.9	2.6	5.0	3.7	3.1	2.4	1.7	1.5	1.5	1.5	1.55	1.5
14	2.0	2.6	4.2	3.5	3.0	2.3	1.65	1.55	1.5	1.5	1.55	1.5
15	.....	2.6	4.0	3.2	2.9	2.35	.....	1.5	1.5	1.5	1.85	1.5
16	.....	2.6	3.7	3.2	2.8	2.2	1.6	1.5	1.5	1.5	1.6	1.5
17	1.9	2.6	3.7	3.0	.....	.....	1.6	1.5	1.5	.....	1.6	1.5
18	2.0	3.0	3.7	2.9	3.7	.....	1.6	1.5	.....	1.5	1.65	1.5
19	2.2	3.2	3.5	3.1	2.9	2.1	1.6	1.5	1.5	1.5	1.5	1.5
20	2.4	3.0	3.5	3.0	3.1	1.95	.....	.....	1.5	1.5	1.5	1.5
21	3.0	2.7	3.5	3.1	3.3	1.9	1.6	.....	1.5	1.5	1.45	1.5
22	2.9	2.7	3.0	3.2	3.1	1.9	.....	.....	1.5	1.5	1.5	1.5
23	3.0	2.8	2.9	3.4	3.3	1.9	1.6	1.5	1.5	1.5	1.5	1.5
24	4.0	3.0	2.9	3.5	3.1	1.95	1.6	.....	1.5	1.5	1.5	.....
25	3.2	3.0	2.9	3.9	2.9	1.9	1.55	1.5	1.5	1.5	.....	1.45
26	2.65	3.0	3.1	4.3	2.85	1.9	1.55	1.5	1.5	1.5	1.5	1.45
27	3.2	3.1	3.3	4.1	2.9	1.85	1.6	.....	1.5	.....	1.5	1.5
28	3.6	3.0	3.3	3.8	2.8	1.85	1.55	.....	1.5	.....	1.5	1.6
29	5.5	.....	3.4	3.3	2.9	1.8	1.55	1.5	1.5	.....	1.5	1.5
30	6.4	.....	3.7	3.3	2.8	1.8	1.55	1.5	1.5	1.5	1.5	1.5
31	5.2	.....	3.9	.....	2.75	.....	1.55	.....	.....	1.5	.....	1.5

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Daily discharge, in second-feet, of Goodyear Creek at Goodyear Bar, Cal., for 1910–11.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1910.				1910.				1910.			
1		7	7	11		9	81	21		9	20
2		7	7	12		9	40	22		9	24
3		7	174	13		9	40	23		24	20
4		7	122	14		9	32	24		21	17
5		7	70	15		7	32	25		18	17
6		7	17	16		7	24	26		15	14
7		7	17	17		7	24	27		11	14
8		9	17	18		7	24	28		10	11
9		11	24	19		9	24	29		9	11
10		11	32	20		9	20	30	7	7	11
								31	7		11

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	7	610	222	280	145	112	14	6	4	4	4	4
2	7	545	300	300	145	124	17	6	4	4	4	4
3	7	375	350	375	118	118	17	6	4	3	4	4
4	7	325	545	325	105	105	14	6	4	4	4	4
5	7	280	610	300	205	105	14	6	4	4	4	4
6	7	145	610	300	159	105	11	4	4	4	4	4
7	7	131	680	240	152	105	11	4	4	4	4	4
8	11	118	680	222	145	112	14	4	4	4	4	4
9	24	118	610	205	145	105	14	4	4	4	6	4
10	24	118	575	222	197	105	11	4	4	4	36	4
11	24	70	575	205	250	76	11	4	4	4	7	4
12	24	70	610	222	166	81	11	4	4	4	6	4
13	24	93	610	260	159	70	11	4	4	4	6	4
14	32	93	375	222	145	59	9	6	4	4	6	4
15	30	93	325	174	131	64	8	4	4	4	20	4
16	27	93	260	174	118	49	7	4	4	4	7	4
17	24	93	260	145	189	46	7	4	4	4	7	4
18	32	145	260	131	260	43	7	4	4	4	9	4
19	49	174	222	159	131	40	7	4	4	4	4	4
20	70	145	222	145	159	28	7	4	4	4	4	4
21	145	105	222	159	189	24	7	4	4	4	3	4
22	131	105	145	174	159	24	7	4	4	4	4	4
23	145	118	131	205	189	24	7	4	4	4	4	4
24	325	145	131	222	159	28	7	4	4	4	4	3
25	174	145	131	300	131	24	6	4	4	4	4	3
26	99	145	159	400	124	24	6	4	4	4	4	3
27	174	159	189	350	131	20	7	4	4	4	4	4
28	240	145	189	280	118	20	6	4	4	4	4	7
29	790	.....	205	189	131	17	6	4	4	4	4	4
30	1,180	.....	260	189	118	17	6	4	4	4	4	4
31	680	.....	300	.....	112	.....	6	4	.....	4	.....	4

NOTE.—Daily discharge 1910–11 determined from a rating curve well defined below 300 second-feet. Discharge interpolated for days on which gage was not read except for Dec. 1 and 2, 1910, which was estimated.

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Monthly discharge of Goodyear Creek at Goodyear Bar, Cal., for 1910–11.

[Drainage area, 12.2 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
1910.							
November	24	7	9.8	0.803	0.90	583	C.
December	174	7	32.2	2.64	3.04	1,980	B.
1911.							
January	1,180	7	146	12.0	13.83	8,980	C.
February	610	70	175	14.3	14.89	9,720	A.
March	680	131	354	29.0	33.43	21,800	B.
April	400	131	236	19.3	21.53	14,000	B.
May	260	105	154	12.6	14.53	9,470	A.
June	124	17	62.5	5.12	5.71	3,720	A.
July	17	6	9.5	.779	.90	584	C.
August	6	4	4.4	.361	.42	270	D.
September	4	4	4.0	.328	.37	238	D.
October	4	3	4.0	.328	.38	246	D.
November	26	3	6.3	.516	.58	375	D.
December	7.	3	4.0	.328	.38	246	D.
The year	1,180	3	96.2	7.89	106.95	69,600	

BEAR RIVER NEAR COLFAX, CAL.

Location.—At Pacific Gas & Electric Co.'s diversion dam, in sec. 22, T. 15 N., R. 9 E., about one-half mile below mouth of Greenhorn River and about 3 miles north of Colfax.

Records available.—November 1 to December 31, 1911.

Drainage area.—Not measured.

Gage.—October 20, 1911, a vertical staff was installed on left bank about 500 feet above the dam. This gage was read during November and December, 1911.

Channel.—Gravel and will shift.

Discharge measurements.—Made by wading during 1911. December 9, 1911, a car and cable were installed at the gage above the dam.

Diversions and storage.—Water is both diverted and stored above the station.

Cooperation.—Gage-height record was furnished by Pacific Gas & Electric Co., through James H. Wise, assistant general manager.

Discharge measurements of Bear River near Colfax, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 20	J. E. Stewart	1.41	38
Dec. 9	F. C. Ebert	1.38	34

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Daily gage height, in feet, of Bear River near Colfax, Cal., for 1911.

[J. H. Chubb, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.
1	1.41	1.44	16	1.85	1.33
2	1.42	1.38	17	1.60	1.45
3	1.42	1.35	18	1.61	1.33
4	1.47	1.36	19	1.60	1.32
5	1.71	1 35	20	1.50	1.30
6	1.72	1.36	21	1.49	1.19
7	1.43	1.34	22	1.50	1.24
8	1.42	1.30	23	1.49	1.35
9	1.50	1.34	24	1.48	1.30
10	2.40	1.33	25	1.48	1.20
11	1.60	1.34	26	1.47	1.30
12	1.62	1.30	27	1.49	1.32
13	1.61	1.33	28	1.47	1.40
14	1.60	1.30	29	1.48	1.55
15	1.63	1.32	30	1.45	1.50
			31	.....	1.51

BEAR RIVER AT VAN TRENT,[1] CAL.

Location.—Below highway bridge at McCourtney crossing, in the SE. ¼ sec. 21, T. 14 N., R. 6 E., 1 mile below Van Trent and 8 miles above Wheatland.

Records available.—October 8, 1904, to December 31, 1911.

Drainage area.—263 square miles.

Gage.—Staff in five sections on left bank 500 feet below bridge.

Channel.—Solid rock, bowlders, and gravel. Shifts at high water.

Discharge measurements.—In November, 1909, the car and cable were removed; since this date measurements have been made by wading.

Diversions and storage.—Water is diverted above station for power and irrigation. Storage is also developed on the headwaters of the stream.

Accuracy.—Results good at medium and low stages. Estimates for high water are approximate, as rating curve is not well defined.

Discharge measurements of Bear River at Van Trent, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 25[a]	J. E. Stewart	2.04	234
Oct. 4[b]	do	1.11	40

[a] Measurement by wading 100 feet above gage. [b] Measurement by wading 200 feet above gage.

Daily gage height, in feet, of Bear River at Van Trent, Cal., for 1911.

[Hermann Ernestus, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.2	8.6	4.25	4.0	2.6	1.9	1.3	1.0	1.0	1.1	1.2	1.2
2	1.2	7.2	5.1	4.1	2.6	1.9	1.3	1.0	1.0	1.1	1.1	1.2
3	1.2	6.5	5.0	4.0	2.6	1.9	1.4	1.0	1.0	1.1	1.0	1.1
4	1.2	6.3	8.2	3.9	2.6	1.8	1.3	1.0	1.1	1.1	1.0	1.1
5	1.2	6.3	7.0	5.9	2.6	1.7	1.3	1.2	1.1	1.1	1.3	1.0

[1] Known formerly as "above Wheatland."

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Daily gage height, in feet, of Bear River at Van Trent, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
6	1.2	6.8	9.8	6.4	2.8	1.7	1.3	1.1	1.1	1.3	1.3	1.1
7	1.2	5.7	13.0	4.8	2.6	1.9	1.2	1.1	1.1	1.3	1.2	1.1
8	1.2	5.2	8.5	4.3	2.5	2.0	1.2	1.2	1.1	1.2	1.1	1.0
9	1.2	5.0	6.7	4.1	2.5	1.9	1.2	1.1	1.1	1.1	1.0	1.0
10	2.5	4.8	6.5	4.2	2.5	1.8	1.2	1.1	1.1	1.3	1.85	1.0
11	1.8	6.9	5.7	3.8	2.4	1.7	1.2	1.1	1.1	1.3	1.8	1.0
12	7.75	5.3	5.3	3.6	2.3	1.7	1.2	1.1	1.1	1.3	1.3	1.0
13	7.1	7.2	4.9	3.5	2.3	1.7	1.2	1.1	1.1	1.3	1.3	1.0
14	12.7	5.6	4.7	3.3	2.3	1.7	1.1	1.1	1.0	1.2	1.1	1.0
15	7.2	4.9	4.5	3.1	2.3	1.6	1.1	1.1	1.0	1.2	1.1	1.0
16	4.0	4.6	4.4	3.0	2.3	1.6	1.1	1.1	1.0	1.1	1.8	.9
17	3.4	4.4	4.3	2.9	2.2	1.6	1.1	1.1	1.0	1.1	1.6	.9
18	3.0	4.3	4.2	2.9	2.2	1.6	1.1	1.1	1.0	1.0	1.5	1.1
19	2.8	4.2	4.2	2.9	2.4	1.6	1.0	1.1	1.0	1.0	1.4	1.1
20	13.7	4.1	4.2	2.9	2.2	1.5	1.0	1.1	1.0	1.0	1.3	1.0
21	7.2	4.0	4.2	2.8	2.2	1.5	1.0	1.1	1.0	.9	1.3	1.0
22	4.9	3.9	4.1	2.8	2.1	1.5	1.0	1.1	.9	.9	1.2	.9
23	4.3	3.8	4.1	2.8	2.1	1.4	1.0	1.1	.9	1.0	1.3	.9
24	11.95	3.8	4.1	2.8	2.1	1.4	1.0	1.1	.9	1.0	1.2	.9
25	10.9	3.7	4.1	2.9	2.1	1.4	1.0	1.1	1.0	1.2	1.1	.9
26	8.2	3.7	4.0	2.9	2.0	1.4	1.0	1.1	1.0	1.1	1.1	1.0
27	6.3	3.7	3.9	2.9	2.0	1.4	1.0	1.1	1.0	1.3	1.1	1.0
28	9.3	3.9	3.9	2.9	2.0	1.4	1.0	1.1	1.0	1.5	1.1	1.0
29	9.1	.....	3.9	2.8	1.9	1.4	1.0	1.1	1.0	1.4	1.1	1.1
30	13.5	.....	4.0	2.7	1.9	1.3	1.0	1.0	1.0	1.3	1.2	1.1
31	16.7	.....	4.0	.....	1.9	.....	1.0	1.0	.....	1.2	.....	1.2

Daily discharge, in second-feet, of Bear River at Van Trent, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	53	4,300	994	880	361	178	66	32	32	42	53	53
2	53	2,910	1,430	925	361	178	66	32	32	42	42	53
3	53	2,350	1,370	880	361	178	81	32	32	42	32	42
4	53	2,200	3,860	835	361	156	66	32	42	42	32	42
5	53	2,200	2,750	1,920	361	135	66	53	42	42	66	32
6	53	2,590	5,860	2,280	420	135	66	42	42	66	66	42
7	53	1,790	12,000	1,260	361	178	53	42	42	66	53	42
8	53	1,480	4,180	1,020	332	201	53	53	42	53	42	32
9	53	1,370	2,510	925	332	178	53	42	42	42	32	32
10	332	1,260	2,350	971	332	156	53	42	42	66	167	32
11	156	2,670	1,790	791	303	135	53	42	42	66	156	32
12	3,440	1,540	1,540	709	276	135	53	42	42	66	66	32
13	2,830	2,910	1,320	670	276	135	53	42	42	66	66	32
14	11,300	1,720	1,210	594	276	135	42	42	32	53	42	32
15	2,910	1,320	1,110	521	276	115	42	42	32	53	42	32
16	880	1,160	1,060	486	276	115	42	42	32	42	156	23
17	632	1,060	1,020	452	250	115	42	42	32	42	115	23
18	486	1,020	971	452	250	115	42	42	32	32	97	42
19	420	971	971	452	303	115	32	42	32	32	81	42
20	13,700	925	971	452	250	97	32	42	32	32	66	32
21	2,910	880	971	420	250	97	32	42	32	23	66	32
22	1,320	835	925	420	225	97	32	42	23	23	53	23
23	1,020	791	925	420	225	81	32	42	23	32	66	23
24	9,640	791	925	420	225	81	32	42	23	32	53	23
25	7,620	749	925	452	225	81	32	42	32	53	42	23
26	3,860	749	880	452	201	81	32	42	32	42	42	32
27	2,200	749	835	452	201	81	32	42	32	66	42	32
28	5,160	835	835	452	201	81	32	42	32	97	42	32
29	4,900	.....	835	420	178	81	32	42	32	81	42	42
30	13,200	.....	880	390	178	66	32	32	32	66	53	42
31	22,200	.....	880	.....	178	.....	32	32	.....	53	.....	53

NOTE.—Daily discharge determined from a rating curve fairly well defined below 2,000 second-feet, and not at all defined above that discharge.

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Monthly discharge of Bear River at Van Trent, Cal., for 1911.

[Drainage area, 263 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	22,200	53	3,600	13.70	15.79	221,000	C.
February	4,300	749	1,580	6.01	6.26	87,800	C.
March	12,000	835	1,910	7,26	8,37	117,000	C.
April	2,280	390	726	2.76	3.08	43,000	B.
May	420	178	278	1.06	1.22	17,100	B.
June	178	66	124	.471	.53	7,380	B.
July	81	32	45.4	.173	.20	2,790	C.
August	53	32	40.8	.155	.18	2,510	C.
September	42	23	34.4	.131	.15	2,050	C.
October	97	23	50.2	.191	.22	3,090	C.
November	167	32	65.8	.250	.28	3,920	C.
December	53	23	34.9	.133	.15	2,150	C.
The year	22,200	23	705	2.68	36.43	510,000	

AMERICAN RIVER AND TRIBUTARIES.

NORTH FORK OF AMERICAN RIVER NEAR COLFAX, CAL.

Location.—At bridge on Colfax and Forest Hill road, in the SW. ¼ sec. 19, T. 14 N., R. 10 E., 150 feet below mouth of Shirttail Canyon Creek, 11 miles above junction with the Middle Fork and 5 miles southeast of Colfax.

Records available.—August 16 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in three sections on right bank, about 50 feet below bridge.

Channel.—Gravel and small bowlders—tailings from placer mining; will shift at high water.

Discharge measurements.—Made from bridge or by wading.

Discharge measurements of North Fork of American River near Colfax, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 16[a]	F. C. Ebert	3.29	122
Dec. 10[b]	Lasley Lee	3.10	75

[a] Made by wading 300 feet below gage. [b] Made by wading 150 feet below gage.

Daily gage height, in feet, of North Fork of American River near Colfax, Cal., for 1911.

[C. J. McDonald, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1		3.2	3.25	3.10	3.18	16	3.3	3.2	3.10	3.35	3.10
2		3.2	3.25	3.10	3.18	17	3.3	3.2	3.10	3.20	3.15
3		3.2	3.25	3.10	3.15	18	3.3	3.2	3.12	3.20	3.10
4		3.2	3.25	3.10	3.18	19	3.3	3.2	3.12	3.18	3.10
5		3.2	3.25	3.10	3.15	20	3.3	3.2	3.15	3.18	3.15
6		3.2	3.25	3.10	3.18	21	3.3	3.2	3.15	3.18	3.10
7		3.2	3.25	3.10	3.15	22	3.3	3.2	3.12	3.18	3.10
8		3.2	3.25	3.10	3.15	23	3.3	3.2	3.12	3.18	3.12
9		3.2	3.28	3.10	3.18	24	3.2	3.2	3.12	3.18	3.10
10		3.2	3.25	3.75	3.10	25	3.2	3.2	3.10	3.18	3.10
11		3.2	3.22	3.75	3.10	26	3.2	3.2	3.10	3.12	3.10
12		3.2	3.25	3.20	3.10	27	3.2	3.2	3.10	3.12	3.10
13		3.2	3.18	3.22	3.10	28	3.2	3.2	3.10	3.12	3.18
14		3.2	3.18	3.15	3.10	29	3.2	3.2	3.10	3.18	3.15
15		3.2	3.05	3.22	3.10	30	3.2	3.2	3.10	3.18	3.15
						31	3.2	.....	3.30	.....	3.15

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AMERICAN RIVER AT FAIROAKS, CAL.

Location.—At highway bridge, 1,500 feet northwest of Southern Pacific Co.'s railroad station at Fairoaks Bridge and half a mile southeast of Fairoaks.

Records available.—November 3, 1904, to December 31, 1911.

Drainage area.—1,910 square miles.

Gage.—Painted on right abutment of bridge near downstream end, with a vertical staff for low water. The position of the gage has been changed several times since the station was established, but no change has been made in its datum.

Channel.—Gravel and small bowlders; shifts slightly at high water.

Discharge measurements.—Made from downstream side of bridge and by wading.

Diversions.—Water is diverted and stored for power and irrigation above the station.

Accuracy.—A comparison of the hydrographs of daily gage heights at Folsom and at Fairoaks for 1911 indicates that both records are good for the first four months, but not from May 1 to August 9. Comparison of observer's with hydrographer's readings on May 6 and July 8 indicates that the Fairoaks records are much in error on these two days and hence, inferentially, for the rest of the above-noted period. Comparisons with records of stations on other streams in a situation similar to that of the American River, indicate that the Folsom record is the better. The values published in the first table of gage heights are uncorrected gage heights. The gage heights published in the second table are corrected by comparison with the record at Folsom.

The record at Fairoaks from August 10 to September 30, 1911, is considered fairly satisfactory. It does not agree with the Folsom records, but these are known to be poor at extreme low stage, as part of the water is by-passed around the gage. The stage during this period did not vary greatly. The measurement made October 3 confirms the record for the last part of the period, and preliminary estimates of discharge at Placerville and Colfax tend to confirm the gage heights August 10 to September 30.

Readings made by a new observer October 1 to December 31 are about 2 feet too high as compared with gage heights at Folsom and preliminary estimates of discharge at Placerville, Colfax, and East Auburn, and accordingly are not published. The rating curves developed for 1911 are good.

Discharge measurements of American River at Fairoaks, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 12	H. D. McGlashan	12.90	35,000
29	do	9.35	17,500
29	do	9.95	21,000
30	do	19.90	72,700
31	do	21.90	78,600
Mar. 22	J. E. Stewart	7.38	9,530
May 6	do	8.54	14,200
July 8	do	5.48	4,880
Oct. 3[a]	do	2.58	361

[a] Made by wading 300 feet below bridge.

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Daily gage height, in feet, of American River at Fairoaks, Cal., for 1911.

[M. J. Ferry, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	2.3	13.7	5.2	9.6	8.0	8.7	6.9	3.7	2.5	.....
2	2.3	10.6	6.3	9.8	8.1	8.8	6.8	3.6	2.5	.....
3	2.3	9.85	7.1	9.8	8.1	8.8	6.7	3.5	2.5	2.58
4	2.3	9.3	10.0	9.0	8.1	9.0	6.6	3.4	2.6	.....
5	2.2	8.9	10.2	10.3	8.1	9.1	6.5	3.5	2.5	.....
6	2.2	8.1	9.1	11.8	8.1	9.3	6.4	3.5	2.5	.....
7	2.2	7.5	14.2	10.0	8.0	9.7	6.6	3.5	2.5	.....
8	2.1	7.3	12.6	9.8	8.0	9.6	6.3	3.5	2.5	.....
9	2.1	6.9	9.7	9.5	7.9	9.6	6.1	3.5	2.6	.....
10	3.75	6.3	9.2	9.0	7.7	9.5	6.0	2.7	2.5	.....
11	5.95	8.3	8.6	8.2	7.7	9.4	5.8	2.7	2.5	.....
12	11.0	9.5	7.8	8.2	7.8	9.3	5.7	2.7	2.5	.....
13	11.2	8.2	7.5	8.0	7.8	9.1	5.5	2.8	2.5	.....
14	11.6	7.9	7.2	7.6	7.9	8.9	5.5	2.7	2.5	.....
15	9.6	7.5	7.0	7.1	7.9	8.7	5.3	2.8	2.5	.....
16	6.05	7.5	6.9	6.8	7.9	8.5	5.3	2.7	2.5	.....
17	5.2	7.2	6.9	6.8	8.0	8.3	5.1	2.7	2.5	.....
18	4.9	7.0	7.0	7.0	8.2	8.2	5.0	2.7	2.5	.....
19	4.8	6.7	7.0	7.3	8.4	7.9	4.9	2.6	2.5	.....
20	9.8	6.1	7.0	8.4	8.6	7.6	4.8	2.6	2.5	.....
21	8.0	5.5	7.0	8.7	8.7	7.3	4.6	2.6	2.4	.....
22	6.5	5.5	7.2	8.8	8.8	7.2	4.6	2.6	2.4	.....
23	6.7	5.2	7.4	9.0	8.7	7.0	4.5	2.5	2.4	.....
24	10.15	5.1	7.6	9.1	8.6	6.7	4.2	2.6	2.4	.....
25	12.3	5.0	7.7	9.3	8.9	6.3	4.2	2.5	2.4	.....
26	10.4	5.1	7.8	9.7	8.7	6.1	4.1	2.7	2.4	.....
27	8.5	5.0	7.9	9.4	8.8	6.2	4.2	2.5	2.5	.....
28	8.3	5.1	8.0	9.3	9.0	6.4	4.0	2.6	2.5	.....
29	10.5	.....	8.1	8.7	8.8	6.9	3.9	2.6	2.5	.....
30	19.05	.....	8.5	8.5	8.7	7.2	3.9	2.6	2.5	.....
31	19.7	.....	9.0	.....	8.6	.....	3.8	2.5	.....	.....

NOTE.—Gage heights May 1 to Aug. 9 subject to error. See description. Gage heights Jan. 10–16, 19–21, 24–27, 29 to Feb. 1, determined graphically.

Corrected daily gage height, in feet, of American River at Fairoaks, Cal., for 1911.

Day.	May.	June.	July.	Aug.	Day.	May.	June.	July.	Aug.
1	8.2	9.0	6.0	3.0	16	8.1	10.6	4.8	.....
2	8.4	9.5	6.0	3.0	17	7.8	10.6	4.7	.....
3	8.5	10.1	6.0	2.9	18	7.5	10.6	4.6	.....
4	8.9	10.5	5.9	2.9	19	7.6	10.5	4.4	.....
5	9.8	10.7	5.8	2.9	20	7.9	9.9	4.2	.....
6	8.6	10.9	5.8	2.9	21	8.4	9.2	4.1	.....
7	8.4	10.6	5.7	2.8	22	9.2	8.3	3.9	.....
8	8.4	10.5	5.5	2.8	23	10.2	7.5	3.7	.....
9	8.4	10.5	5.2	2.8	24	10.6	6.9	3.6	.....
10	8.3	10.6	5.0	.....	25	8.9	6.5	3.6	.....
11	8.5	10.9	5.0	.....	26	8.6	6.3	3.6	.....
12	8.9	11.2	4.9	.....	27	8.7	6.6	3.5	.....
13	9.0	11.0	4.9	.....	28	9.0	7.3	3.3	.....
14	8.7	10.8	4.9	.....	29	9.2	6.9	3.2	.....
15	8.4	10.7	4.8	.....	30	9.4	6.5	3.2	.....
					31	9.7	.....	3.1	.....

NOTE.—Gage heights corrected by comparison with Folsom gage heights for use in determining the daily discharge.

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Daily discharge, in second-feet, of American River at Fairoaks, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	525	37,300	4,120	18,000	12,400	15,500	5,930	720	310	.....
2	525	22,400	6,690	18,900	13,200	17,600	5,930	720	310	.....
3	525	19,100	8,930	18,900	13,500	20,200	5,930	615	310	358
4	525	16,700	19,700	15,500	15,100	21,900	5,690	615	370	.....
5	455	15,100	20,600	21,100	18,900	22,800	5,450	615	310	.....
6	455	12,100	15,900	28,000	13,900	23,800	5,450	615	310	.....
7	455	10,200	39,800	19,700	13,200	22,400	5,210	520	310	.....
8	390	9,530	31,900	18,900	13,200	21,900	4,760	520	310	.....
9	390	8,340	18,400	17,600	13,200	21,900	4,120	520	370	.....
10	2,280	6,690	16,300	15,500	12,800	22,400	3,720	440	310	.....
11	6,850	12,800	13,900	12,400	13,500	23,800	3,720	440	310	.....
12	24,800	17,600	11,100	12,400	15,100	25,200	3,530	440	310	.....
13	25,700	12,400	10,200	11,800	15,500	24,200	3,530	520	310	.....
14	27,500	11,400	9,230	10,500	14,300	23,300	3,530	440	310	.....
15	18,800	10,200	8,630	8,930	13,200	22,800	3,340	520	310	.....
16	7,090	10,200	8,340	8,050	12,100	22,400	3,340	440	310	.....
17	5,100	9,230	8,340	8,050	11,100	22,400	3,160	440	310	.....
18	4,440	8,630	8,630	8,630	10,200	22,400	2,980	440	310	.....
19	4,220	7,770	8,630	9,530	10,500	21,900	2,640	370	310	.....
20	19,600	6,180	8,630	13,200	11,400	19,300	2,320	370	310	.....
21	12,800	4,760	8,630	14,300	13,200	16,300	2,160	370	260	.....
22	8,220	4,760	9,230	14,700	16,300	12,800	1,850	370	260	.....
23	8,780	4,120	9,840	15,500	20,600	10,200	1,560	310	260	.....
24	21,100	3,920	10,500	15,900	22,400	8,340	1,420	370	260	.....
25	30,700	3,720	10,800	16,700	15,100	7,220	1,420	310	260	.....
26	12,200	3,920	11,100	18,400	13,900	6,690	1,420	440	260	.....
27	14,500	3,720	11,400	17,200	14,300	7,490	1,300	310	310	.....
28	13,800	3,920	11,800	16,700	15,500	9,530	1,050	370	310	.....
29	22,600	.....	12,100	14,300	16,300	8,340	935	370	310	.....
30	65,500	.....	13,500	13,500	17,200	7,220	935	370	310	.....
31	69,100	.....	15,500	.....	18,400	.....	825	310	.....	.....

NOTE.—Daily discharge determined from two well-defined curves; one applicable to Jan. 31 (the 1910 curve) and the other for the remainder of the year.

Monthly discharge of American River at Fairoaks, Cal., for 1911.

[Drainage area, 1,910 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	69,100	390	13,900	7.28	8.39	855,000	B.
February	37,300	3,720	10,600	5.55	5.78	589,000	B.
March	39,800	4,120	13,000	6.81	7.85	799,000	B.
April	28,000	8,050	15,100	7.91	8.82	898,000	B.
May	22,400	10,200	14,500	7.59	8.75	892,000	B.
June	25,200	6,690	17,700	9.27	10.34	1,050,000	C.
July	5,930	825	3,200	1.68	1.92	197,000	C.
August	720	310	459	.240	.28	28,200	C.
September	370	260	304	.159	.18	18,100	C.
October	.....	.....	350	.183	.21	21,500	C.
November	.....	.....	430	.225	.25	25,600	C.
December	.....	.....	400	.209	.24	24,600	C.
The year	69,100	.....	7,460	3.91	53.01	5,400,000	

NOTE.—Mean discharge October, November, and December is the combined discharge (preliminary estimates) of North Fork of American River near Colfax, Middle Fork of American River near East Auburn, and South Fork of American River near Placerville, plus an assumed inflow of 20 to 30 second-feet.

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MIDDLE FORK OF AMERICAN RIVER NEAR EAST AUBURN, CAL.

Location.—At Mountain Quarry Co.'s plant, about 1½ miles above the junction with North Fork of American River and 3½ miles northeast of Auburn, in the SE. ¼ sec. 6, T. 12 N., R. 9 E.

Records available.—October 22 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff in two sections on left bank at pump house.

Channel.—Gravel and small bowlders; will shift at high stages.

Discharge measurements.—Made from car and cable 300 feet below gage and by wading.

Discharge measurements of Middle Fork of American River near East Auburn, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 19 [a]	J. E. Stewart	1.60	105
Dec. 11 [b]	F. C. Ebert	1.88	161

[a] Made by wading 150 feet below gage. [b] Made by wading 300 feet below gage.

Daily gage height, in feet, of Middle Fork of American River near East Auburn, Cal., for 1911.

[W. B. Arndt, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	1.7	1.7	11	.....	2.3	1.9	21	.....	1.8	1.9
2	.....	1.7	1.7	12	.....	2.0	1.8	22	1.6	1.7	1.9
3	.....	1.7	1.7	13	.....	1.9	1.8	23	1.6	1.7	1.9
4	.....	1.7	1.7	14	.....	1.9	1.8	24	1.6	1.7	1.9
5	.....	1.7	1.7	15	.....	1.9	1.8	25	1.7	1.7	1.9
6	.....	1.7	1.7	16	.....	2.0	1.8	26	1.9	1.7	1.9
7	.....	1.7	1.9	17	.....	2.0	1.9	27	1.8	1.7	1.9
8	.....	1.7	2.0	18	.....	1.8	1.9	28	1.7	1.7	1.9
9	.....	1.7	1.9	19	1.6	1.8	1.9	29	1.7	1.7	1.9
10	.....	2.4	1.9	20	.....	1.8	1.9	30	1.7	1.7	2.1
								31	1.7	.....	2.2

RUBICON RIVER AT RUBICON SPRINGS, CAL.

Location.—In the SE. ¼ sec. 31, T. 14 N., R. 16 E., at Rubicon Springs, about three-fourths of a mile above the mouth of Millers Creek.

Records available.—February 1, 1910, to August 31, 1911.

Drainage area.—31.6 square miles.

Gage.—Staff.

Channel.—Sand and gravel; fairly permanent.

Discharge measurements.—Made from car and cable.

Winter flow.—Affected by ice.

Accuracy.—Results excellent except for winter months.

Cooperation.—Records of daily discharge furnished by Stone & Webster Engineering Corporation.

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Daily discharge, in second-feet, of Rubicon River at Rubicon Springs, Cal., for 1910–11.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.											
1	72	304	142	249	492	79	12	1	1	1	26
2	67	316	142	208	179	70	12	1	1	1	61
3	72	281	115	281	218	61	6	1	1	1	537
4	67	270	124	189	198	61	6	0	1	1	115
5	62	142	142	124	170	61	6	0	1	1	70
6	67	124	151	238	142	61	6	0	1	1	97
7	67	88	151	328	133	61	6	0	1	1	124
8	62	97	238	406	133	70	6	0	1	1	151
9	62	106	228	522	133	61	6	0	1	1	208
10	62	106	238	675	151	52	3	0	1	12	270
11	62	124	218	392	170	52	3	0	1	179	228
12	67	160	160	448	133	52	3	0	1	52	88
13	72	142	170	448	151	52	3	0	1	34	52
14	83	142	198	568	124	43	3	0	1	26	43
15	67	97	198	420	124	43	3	0	1	18	43
16	67	70	228	341	115	43	3	115	1	12	34
17	72	106	218	354	115	43	3	115	1	12	34
18	67	88	208	366	124	43	3	97	1	18	26
19	62	801	406	292	124	61	3	34	1	12	26
20	62	353	420	379	124	43	1	6	1	12	26
21	62	160	316	434	88	43	1	6	1	12	26
22	72	106	304	477	88	34	1	3	1	12	18
23	72	106	392	568	70	34	1	3	1	507	18
24	67	79	379	598	79	34	1	3	1	115	18
25	88	61	392	341	97	26	1	3	1	70	18
26	72	61	434	316	97	26	1	1	1	70	18
27	72	70	406	366	97	18	1	1	1	52	18
28	67	43	434	316	79	18	1	1	1	43	12
29	.....	61	249	420	97	18	1	1	1	34	12
30	.....	88	353	477	88	12	1	1	1	34	12
31	.....	106	.....	492	.....	12	1	.....	1	.....	12

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	12	135	26	353	270	785	406	70
2	12	105	24	316	270	977	463	70
3	12	81	26	292	507	833	341	70
4	12	71	42	189	659	1,136	463	70
5	6	61	39	160	448	977	463	70
6	6	54	36	142	249	721	448	61
7	6	48	45	133	249	899	420	61
8	6	42	42	133	270	769	366	61
9	70	42	36	142	238	899	341	61
10	30	42	45	97	316	1,020	316	61
11	15	42	42	170	434	1,162	379	61
12	17	36	39	70	406	977	341	43
13	18	36	39	70	366	1,136	366	34
14	20	38	39	70	292	1,042	379	34
15	20	31	42	61	259	1,136	406	34
16	17	28	45	88	218	1,111	379	34
17	17	33	48	124	170	1,162	379	34
18	17	31	54	189	238	1,136	304	34
19	28	31	60	208	341	1,245	208	34
20	57	31	67	151	507	1,020	179	26
21	42	28	74	189	721	899	179	26
22	31	28	78	259	849	675	106	26
23	26	28	93	353	1,162	434	218	26
24	57	28	97	392	492	328	151	26
25	54	26	97	492	379	420	124	26
26	33	24	89	477	448	706	106	26
27	28	26	73	270	553	899	106	26
28	26	24	116	228	537	568	97	18
29	93	.....	144	218	706	492	88	18
30	421	.....	156	249	833	379	88	18
31	257	.....	163	.....	448	.....	79	18

NOTE.—Daily discharge May 17, 1910, interpolated by engineers of the United States Geological Survey.

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Monthly discharge of Rubicon River at Rubicon Springs, Cal., for 1910–11.

[Drainage area, 31.6 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
1910.						
February	88	62	68.3	2.16	2.25	3,790
March	353	43	157	4.97	5.73	9,650
April	434	115	258	8.17	9.12	15,400
May	675	124	388	12.3	14.18	23,900
June	492	70	138	4.37	4.88	8,210
July	70	12	44.7	1.41	1.63	2,750
August	12	1	3.5	.111	.13	215
September	115	0	13.1	.415	.46	780
October	1	1	1.0	.032	.04	61
November	507	1	44.8	1.42	1.58	2,670
December	537	12	78.7	2.49	2.87	4,840
The period						72,300
1911.						
January	421	6	47.3	1.50	1.73	2,910
February	135	24	43.9	1.39	1.45	2,440
March	163	24	65.0	2.06	2.38	4,000
April	492	61	210	6.65	7.42	12,500
May	1,160	170	446	14.1	16.26	27,400
June	1,240	328	861	27.2	30.35	51,200
July	463	79	280	8.86	10.22	17,200
August	70	18	41.2	1.30	1.50	2,530
The period						120,000

RUBICON RIVER NEAR QUINTETTE, CAL.

Location.—In the NW. ¼ SW. ¼ sec. 24, T. 13 N., R. 13 E., about 1 mile below mouth of Little South Fork of Rubicon River, half a mile above the trail crossing to Ellicott, and 11½ miles northeast of Quintette.

Records available.—November 21, 1909, to August 31, 1911.

Drainage area.—198 square miles.

Channel.—In solid rock.

Discharge measurements.—Made from car and cable.

Accuracy.—Results excellent.

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

Daily discharge, in second-feet, of Rubicon River near Quintette, Cal., for 1909–1911.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1909.			1909.			1909.		
1		6,660	11		844	21	7,560	358
2		2,570	12		758	22	6,270	388
3		1,350	13		715	23	4,000	328
4		934	14		674	24	2,200	274
5		844	15		593	25	1,385	250
6		758	16		554	26	888	274
7		715	17		484	27	758	274
8		844	18		452	28	934	274
9		2,312	19		420	29	934	274
10		1,132	20		388	30	1,200	328
						31		3,000

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Daily discharge, in second-feet, of Rubicon River near Quintette, Cal., for 1909–1911—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	1,250	452	888	1,190	1,385	1,132	168	40	7	12	12	148
2	888	420	960	1,460	1,250	1,028	150	40	7	12	9	148
3	674	452	1,028	1,190	1,500	888	150	31	7	12	9	2,900
4	593	420	1,250	1,132	1,190	758	133	31	7	12	9	735
5	554	388	1,078	1,250	960	715	133	31	7	12	9	414
6	554	420	1,028	1,250	1,078	633	116	23	7	12	9	297
7	518	420	934	1,315	1,315	593	116	23	7	12	9	778
8	484	388	934	1,580	1,839	554	116	23	7	12	9	489
9	484	388	1,078	1,840	2,140	518	133	23	7	12	15	569
10	452	388	1,132	2,010	2,312	554	133	23	7	10	54	735
11	420	388	1,190	2,010	1,753	518	116	19	7	20	54	1,690
12	358	420	1,315	1,385	1,668	484	116	19	5	25	297	735
13	388	452	1,250	1,580	1,753	484	100	16	5	30	166	489
14	388	518	1,385	1,670	1,753	420	89	16	5	20	113	324
15	388	420	1,132	1,580	1,582	358	100	16	11	15	113	297
16	420	420	980	1,750	1,582	420	89	13	49	15	97	272
17	388	452	1,078	2,010	1,190	388	89	13	150	68	68	248
18	388	420	1,190	2,398	1,190	388	78	13	68	68	68	225
19	388	388	1,385	2,226	1,250	388	89	11	49	54	82	225
20	358	388	1,750	2,226	1,190	358	187	11	40	34	82	204
21	358	388	2,100	2,097	1,250	300	116	11	31	27	82	185
22	484	452	1,580	2,183	1,315	250	89	11	23	20	82	166
23	934	452	1,315	2,312	1,250	250	78	11	23	20	910	148
24	980	420	1,078	2,484	1,385	228	78	9	19	15	450	130
25	758	554	934	2,398	1,315	250	68	9	16	15	414	130
26	633	452	888	2,312	1,190	274	58	9	16	12	248	130
27	554	452	800	2,183	1,190	274	58	9	13	12	204	113
28	554	420	758	3,000	1,132	274	58	9	13	12	148	113
29	554	.....	758	2,010	1,078	207	49	7	13	12	148	113
30	518	.....	888	2,312	1,132	187	49	7	11	12	148	113
31	518	.....	934	.....	1,190	.....	49	7	.....	12	.....	113

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	97	1,828	352	2,624	1,901	2,714	1,320	248
2	97	1,438	324	2,537	1,768	3,831	1,320	225
3	82	1,102	352	2,452	2,286	4,060	1,378	225
4	82	956	569	1,901	2,806	4,420	1,320	204
5	82	821	529	2,537	2,996	4,298	1,320	204
6	82	735	489	2,368	1,901	3,504	1,378	185
7	82	651	610	1,975	1,768	3,944	1,208	166
8	82	569	569	1,901	1,975	3,296	1,052	166
9	130	569	489	1,901	1,901	3,831	910	166
10	185	569	610	1,498	1,901	4,673	956	148
11	204	569	569	1,263	2,127	4,545	956	148
12	225	489	529	1,154	2,286	4,298	910	130
13	248	489	529	1,003	2,286	4,420	910	130
14	272	382	529	956	2,050	4,060	865	130
15	272	414	569	956	1,901	3,504	865	113
16	225	382	610	1,102	1,828	4,178	865	113
17	225	450	651	1,320	1,498	3,831	821	113
18	225	414	735	1,768	1,561	3,504	735	113
19	382	414	821	1,768	1,690	3,720	693	113
20	778	414	910	1,498	2,205	3,296	569	97
21	569	382	1,003	1,690	2,900	2,900	450	82
22	414	382	1,052	2,050	3,504	2,286	414	82
23	352	382	1,263	2,537	4,673	1,768	382	82
24	778	382	1,320	2,900	2,996	1,438	414	82
25	735	352	1,320	3,094	2,205	1,378	382	82
26	450	324	1,208	2,806	2,127	2,050	352	82
27	382	352	1,320	2,127	2,368	2,368	324	68
28	352	324	1,378	1,561	2,624	1,901	324	68
29	1,263	.....	1,768	1,498	2,452	1,561	297	68
30	5,766	.....	2,127	1,768	3,296	1,378	297	54
31	3,504	.....	2,205	.....	2,537	.....	272	54

NOTE.—Daily discharge Nov. 23, 24, and 30, 1909, estimated by engineers of the United States Geological Survey from records of discharge at adjacent stations.

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Monthly discharge of Rubicon River near Quintette, Cal., for 1909–1911.

[Discharge area, 198 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
1909.						
November 21–30	7,560	758	2,610	13.2	4.91	51,800
December	6,660	250	968	4.89	5.64	59,500
1910.						
January	1,250	358	554	2.80	3.23	34,100
February	554	388	428	2.16	2.25	23,800
March	2,100	758	1,130	5.71	6.58	69,500
April	3,000	1,130	1,880	9.49	10.60	112,000
May	2,310	980	1,400	7.07	8.15	86,100
June	1,130	187	469	2.37	2.64	27,900
July	187	49	102	.515	.59	6,270
August	40	7	17.2	.087	.10	1,060
September	150	5	21.2	.107	.12	1,260
October	68	10	20.5	.104	.12	1,260
November	910	9	137	.692	.77	8,150
December	2,900	113	431	2.18	2.51	26,500
The year	3,000	5	549	2.77	37.66	398,000
1911.						
January	5,770	82	601	3.04	3.50	37,000
February	1,830	324	591	2.98	3.10	32,800
March	2,200	324	881	4.45	5.13	54,200
April	3,090	956	1,880	9.49	10.59	112,000
May	4,670	1,500	2,330	11.8	13.60	143,000
June	4,670	1,380	3,230	16.3	18.19	192,000
July	1,380	272	783	3.95	4.55	48,100
August	248	54	127	.641	.74	7,810
The period						627,000

LITTLE RUBICON RIVER NEAR RUBICON SPRINGS, CAL.

Location.—At trail crossing one-fourth mile below Buck Island Lake and about 1 mile southwest of Rubicon Springs, in the NW. ¼ NW. ¼ sec. 6, T. 13 N., R. 16 E.

Records available.—November 1, 1910, to August 31, 1911.

Drainage area.—7 square miles.

Gage.—Staff, read every other day.

Channel.—Solid granite.

Discharge measurements.—Made from footbridge.

Winter flow.—Affected by ice.

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

Daily discharge, in second-feet, of Little Rubicon River near Rubicon Springs, Cal., for 1910–1911.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1	0	8	11	0	143	21	8	8
2	0	104	12	5	85	22	8	8
3	0	200	13	13	28	23	38	8
4	0	119	14	13	24	24	50	8
5	0	38	15	13	20	25	50	8
6	0	44	16	8	16	26	28	6
7	0	50	17	8	13	27	13	5
8	0	65	18	8	13	28	13	5
9	0	80	19	8	13	29	13	5
10	0	111	20	8	10	30	13	5
						31		5

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Daily discharge, in second-feet, of Little Rubicon River near Rubicon Springs, Cal., for 1910–1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug
1911.								
1	6	120	13	72	64	115	80	5
2	6	75	13	80	64	159	80	5
3	6	57	16	64	91	200	80	5
4	6	41	22	50	119	257	80	5
5	5	33	16	57	99	314	80	5
6	4	16	16	64	80	314	65	5
7	5	33	16	50	72	314	50	5
8	6	29	16	38	64	293	57	6
9	7	22	16	38	64	272	64	5
10	8	22	22	38	64	293	64	5
11	11	22	22	28	81	314	64	5
12	11	22	16	20	98	293	50	5
13	14	22	16	20	89	272	38	5
14	12	22	16	20	80	253	78	5
15	9	22	16	20	80	234	119	5
16	9	22	16	20	80	253	99	5
17	9	21	22	28	59	272	80	5
18	9	16	29	38	38	253	57	5
19	31	16	29	28	59	234	38	5
20	24	16	29	50	80	176	38	5
21	20	16	23	50	140	119	38	3
22	18	16	27	50	200	108	28	2
23	31	21	22	74	185	98	20	2
24	27	16	27	98	170	98	12	2
25	24	13	30	108	125	98	5	2
26	16	16	22	119	80	134	3	2
27	14	13	14	84	99	170	1	2
28	36	13	19	50	119	134	1	2
29	36	.....	22	57	131	98	2	2
30	104	.....	33	64	143	89	3	2
31	155	.....	44	.....	131	.....	5	2

Monthly discharge of Little Rubicon River near Rubicon Springs, Cal., for 1910–11.

[Drainage area, 7 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
1910.						
November	50	0	10.2	1.46	1.63	607
December	200	5	40.5	5.79	6.68	2,490
1911.						
January	155	4	21.9	3.13	3.61	1,350
February	120	13	27.6	3.94	4.10	1,530
March	44	13	21.3	3,04	3.50	1,310
April	119	20	52.6	7.51	8.38	3,130
May	200	38	98.3	14.0	16.14	6,040
June	314	89	208	29.7	33.14	12,400
July	119	1	47.7	6.81	7.85	2,930
August	5	2	4.0	.571	0.66	246
The period	.....	.....	.....	.....	.....	28,900

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LITTLE SOUTH FORK OF RUBICON RIVER AT SAWMILL NEAR QUINTETTE, CAL.

Location.—In the NW. ¼ NW. ¼ sec. 24, T. 13 N., R. 14 E., at South Fork sawmill, about half a mile above the mouth of Gerle Creek and 15 miles northeast of Quintette.

Records available.—February 1, 1010, to August 31, 1911.

Drainage area.—16.6 square miles.

Gage.—Staff.

Channel.—Compact gravel.

Discharge measurements.—Made from car and cable.

Winter flow.—Affected by ice.

Accuracy.—Results excellent except for winter months.

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

Daily discharge, in second-feet, of Little South Fork of Rubicon River at sawmill near Quintette, Cal., for 1910–11.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.											
1	74	74	106	106	49	7	0	0.0	0.3	0.5	5
2	161	74	117	117	42	2	0	.0	.3	.5	5
3	150	84	117	117	35	2	0	.0	.3	.5	185
4	95	95	106	95	35	2	0	.0	.3	.5	28
5	65	95	117	84	35	2	0	.0	.3	.5	21
6	57	84	128	95	30	2	0	.0	.3	.5	15
7	49	84	128	161	42	2	0	.0	.3	.5	28
8	42	84	128	161	25	2	0	.0	.3	2	28
9	42	106	172	150	16	2	0	.0	.3	5	48
10	42	106	161	172	20	2	0	.0	.3	2	61
11	35	117	150	128	16	.7	0	.0	2	5	110
12	42	117	139	139	16	.7	0	.0	4	9	37
13	42	106	150	117	16	.7	0	.0	2	9	28
14	42	106	150	139	16	.7	0	.3	2	5	21
15	74	95	183	128	13	.7	0	.3	1	5	15
16	42	95	161	106	16	.7	0	4	1	5	15
17	49	106	183	84	13	.7	0	2	6	5	15
18	35	128	205	95	13	.7	0	2	6	5	9
19	35	328	205	95	10	.7	0	.3	6	5	9
20	35	183	194	84	10	13	0	.3	6	5	9
21	30	139	161	74	10	.7	0	.3	6	5	9
22	35	117	172	74	7	.7	0	.3	3	5	9
23	35	95	183	74	7	.7	0	.3	3	48	9
24	35	84	172	74	7	.7	0	.3	1	21	9
25	49	84	183	74	7	.3	0	.3	1	15	9
26	42	65	205	65	10	.3	0	.3	1	9	9
27	49	42	227	57	10	.3	0	.3	1	9	15
28	65	106	239	49	10	.3	0	.3	.0	9	15
29	.....	65	161	57	7	.3	0	.3	.0	9	9
30	.....	84	128	65	7	.3	0	.3	.0	5	9
31	.....	106	.....	49	.....	.0	0	.....	.0	.....	9

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Daily discharge, in second-feet, of Little South Fork of Rubicon River at sawmill near Quintette, Cal., for 1910–11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	15	309	28	225	185	330	61	5
2	15	166	28	225	185	351	61	5
3	15	128	37	205	309	395	61	5
4	9	92	48	147	395	417	48	5
5	9	76	37	225	246	395	48	5
6	9	37	37	225	205	351	48	5
7	9	76	37	185	185	351	61	5
8	9	61	37	166	225	330	48	5
9	21	48	37	166	205	351	48	5
10	25	48	48	128	246	463	48	5
11	25	48	48	92	288	440	48	5
12	37	48	37	92	288	351	28	5
13	33	48	37	76	246	417	48	5
14	29	48	37	76	225	330	28	5
15	21	48	37	92	205	309	28	2
16	21	48	37	110	166	309	28	2
17	21	48	48	147	147	309	28	2
18	25	37	61	185	166	288	21	2
19	71	37	61	166	225	288	21	2
20	53	37	61	147	288	246	21	2
21	45	37	76	185	395	185	9	2
22	41	37	76	246	440	147	9	2
23	71	48	92	288	509	128	9	2
24	62	37	92	309	246	110	9	2
25	53	28	92	330	205	110	9	2
26	37	37	92	267	225	147	9	2
27	33	25	92	185	267	147	9	2
28	80	28	128	147	246	92	9	2
29	80	.....	147	147	267	76	5	2
30	492	.....	166	185	509	61	5	2
31	345	.....	185	.....	267	.....	5	2

Monthly discharge of Little South Fork of Rubicon River at sawmill near Quintette, Cal., for 1910–11.

[Drainage area, 16.6 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
1910.						
February	161	30	55.3	3.33	3.47	3,070
March	328	42	105	6.33	7.30	6,460
April	239	106	161	9.70	10.82	9,580
May	172	49	99.5	5.99	6.91	6,120
June	49	7	18.3	1.10	1.23	1,090
July	13	.0	1.58	.095	.11	97.2
August	.0	.0	.00	.000	.00	.0
September	4	.0	.41	.025	.03	24.4
October	6	.0	1.77	.107	.12	109
November	48	.5	6.85	.413	.46	406
December	185	5	25.9	1.56	1.80	1,590
The period	.....	.....	.....	.....	.....	28,500
1911.						
January	492	9	58.4	3.52	4.06	3,590
February	309	25	63.0	3.80	3.96	3,500
March	185	28	67.0	4.04	4.66	4,120
April	330	76	179	10.8	12.05	10,700
May	509	147	265	16.0	18.45	16,300
June	463	61	274	16.5	18.41	16,300
July	61	5	29.6	1.78	2.05	1,820
August	5	2	3.4	.205	.24	209
The period	.....	.....	.....	.....	.....	56,500

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LITTLE SOUTH FORK OF RUBICON RIVER BELOW GERLE CREEK, NEAR QUINTETTE, CAL.

Location.—In the SE. ¼ SE. ¼ sec. 21, T. 13 N., R. 14 E., one-fourth mile below Gerle Creek, 1 mile below South Fork sawmill, and 15 miles northeast of Quintette.

Records available.—February 1, 1910, to August 31, 1911.

Drainage area.—49.6 square miles.

Gage.—Staff.

Channel.—Gravel and bowlders, practically permanent.

Discharge measurements.—Made from car and cable.

Diversions.—Water is diverted from Gerle Creek about 1¾ miles above the mouth and discharges into Pilot Creek above Uncle Tom's Cabin.

Winter flow.—Affected by ice.

Accuracy.—Results excellent except for winter months.

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

Daily discharge, in second-feet, of Little South Fork of Rubicon River below Gerle Creek near Quintette, Cal., for 1910–11.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.											
1	195	257	303	375	92	10	5	5	5	2	20
2	125	280	327	375	92	5	3	5	5	2	20
3	215	303	327	375	83	5	3	5	5	2	487
4	125	327	303	327	83	5	5	5	5	2	132
5	112	327	327	280	83	5	5	5	5	2	94
6	112	303	351	303	55	5	5	5	5	2	65
7	112	303	327	424	50	5	5	5	5	2	119
8	112	303	375	424	33	5	5	5	5	5	106
9	102	351	472	424	28	5	5	5	5	7	132
10	102	351	448	472	27	5	5	5	5	5	177
11	102	375	448	351	23	5	5	5	7	10	320
12	102	375	375	351	23	5	5	5	7	24	161
13	112	375	424	327	18	5	5	5	7	16	132
14	112	375	424	327	23	5	5	7	5	13	106
15	125	327	424	303	18	5	5	7	7	10	84
16	125	327	424	235	18	5	5	13	5	10	74
17	112	351	472	215	18	5	5	10	49	10	65
18	102	424	568	215	14	5	5	10	43	10	57
19	92	880	568	195	14	5	5	13	32	13	49
20	92	568	544	175	14	5	5	5	20	10	49
21	69	496	472	175	10	5	5	5	16	10	43
22	83	424	472	175	10	5	5	5	10	10	37
23	75	351	520	155	10	5	5	5	7	49	37
24	102	327	496	155	10	5	5	5	5	32	37
25	112	303	544	155	10	5	5	5	5	37	32
26	102	257	592	125	10	5	5	5	3	28	32
27	112	175	616	125	10	5	5	5	3	24	32
28	215	351	640	112	10	5	5	5	3	28	32
29	.....	257	520	112	10	5	5	5	3	28	24
30	.....	215	472	112	18	5	5	5	2	20	24
31	.....	280	.....	102	.....	5	5	.....	2	.....	28

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Daily discharge, in second-feet, of Little South Fork of Rubicon River below Gerle Creek, near Quintette, Cal., for 1910–11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	32	589	94	702	520	923	146	10
2	28	425	94	702	487	1,028	146	10
3	24	371	106	663	785	1,078	132	10
4	20	320	161	520	923	1,025	132	10
5	20	296	146	625	663	1,025	119	10
6	20	251	132	663	520	875	106	10
7	20	231	119	589	487	973	106	10
8	20	231	94	554	625	923	94	10
9	57	212	106	554	589	923	84	10
10	43	194	146	425	663	1,132	74	10
11	37	177	132	371	785	1,025	74	10
12	37	177	132	320	785	923	49	9
13	70	146	132	296	702	923	65	9
14	70	132	119	296	663	829	49	9
15	65	161	132	320	625	743	49	9
16	48	177	146	371	554	743	43	9
17	47	132	177	455	487	743	37	9
18	48	119	194	554	554	702	37	9
19	59	119	212	554	702	702	32	9
20	170	119	231	487	875	589	28	9
21	146	119	251	554	1,078	487	16	9
22	123	106	273	663	1,132	425	16	9
23	111	119	320	829	1,300	273	16	9
24	155	106	320	875	829	212	16	7
25	133	106	345	829	702	212	16	7
26	100	132	320	702	743	251	12	7
27	88	106	345	487	829	251	13	7
28	78	94	398	371	829	194	12	7
29	219	.....	487	398	785	177	10	7
30	1,360	.....	554	487	1,300	146	12	7
31	785	.....	589	.....	785	.....	13	7

Monthly discharge of Little South Fork of Rubicon River below Gerle Creek, near Quintette, Cal., for 1910–11.

[Drainage area, 49.6 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
1910.						
February	215	69	116	2.34	2.44	6,440
March	880	175	352	7.10	8.19	21,600
April	640	303	452	9.11	10.16	26,900
May	472	102	257	5.18	5.97	15,800
June	92	10	30.4	.613	.68	1,810
July	10	5	5.2	.105	.12	320
August	5	3	4.9	.099	.11	301
September	13	5	6.0	.121.	.14	357
October	49	2	9.4	.190	.22	578
November	49	2	14.1	.284	.32	839
December	487	20	90.5	1.82	2.10	5,560
The period	.....	.....	.....	.....	.....	80,500
1911.						
January	1,360	20	137	2.76	3.18	8,420
February	589	94	195	3.93	4.09	10,800
March	589	94	226	4.56	5.26	13,900
April	875	296	541	10.9	12.16	32,200
May	1,300	487	752	15.2	17.52	46,200
June	1,130	146	682	13.8	15.40	40,600
July	146	10	56.6	1.14	1.31	3,480
August	10	7	8.8	.177	.20	541
The period	.....	.....	.....	.....	.....	156,000

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LITTLE SOUTH FORK OF RUBICON RIVER AT MOUTH, NEAR QUINTETTE, CAL.

Location.—In the SE. ¼ sec. 13, T. 13 N., R. 13 E., about one-fourth mile above the mouth of the river and 13 miles northeast of Quintette.

Records available.—November 29, 1909, to June 30, 1911.

Drainage area.—57.8 square miles.

Gage.—Staff.

Channel.—Composed of bowlders, rough, and somewhat shifting.

Discharge measurements.—Made from car and cable.

Accuracy.—Results good.

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

Daily discharge, in second-feet, of Little South Fork of Rubicon River at mouth, near Quintette, Cal., for 1909–1911.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1909.			1909.			1909.		
1	.....	760	11	.....	450	21	.....	149
2	.....	501	12	.....	380	22	.....	136
3	.....	340	13	.....	340	23	.....	111
4	.....	278	14	.....	332	24	.....	94
5	.....	234	15	.....	316	25	.....	82
6	.....	196	16	.....	219	26	.....	77
7	.....	183	17	.....	196	27	.....	82
8	.....	211	18	.....	183	28	.....	88
9	.....	595	19	.....	169	29	211	88
10	.....	527	20	.....	155	30	255	94
						31	.....	509

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	415	196	309	405	433	155	12	5	5	6	3	16
2	316	183	324	423	397	142	12	3	5	6	3	16
3	248	183	354	380	405	118	8	3	6	6	3	562
4	225	175	380	389	362	111	8	3	6	6	2	214
5	204	169	371	405	347	88	8	5	6	6	2	113
6	196	169	354	423	332	77	8	5	7	6	2	99
7	190	175	347	441	362	66	8	5	7	6	2	199
8	183	162	347	458	405	61	8	5	7	6	2	141
9	183	162	380	492	423	61	5	5	8	6	9	155
10	175	162	380	527	433	56	5	5	8	8	9	155
11	169	155	405	492	397	51	5	5	8	8	11	562
12	149	149	415	467	362	47	5	5	8	8	39	214
13	149	149	433	458	354	47	5	5	8	8	24	169
14	142	155	450	450	332	42	5	5	8	6	14	141
15	150	136	397	433	316	37	5	5	10	8	14	113
16	150	136	354	458	292	37	5	5	16	6	11	99
17	150	142	397	475	255	42	5	5	11	49	11	99
18	150	142	423	492	255	37	5	3	10	60	11	86
19	150	136	458	475	248	33	5	3	9	39	11	86
20	150	136	501	484	234	28	5	3	8	31	11	73
21	150	142	552	467	225	24	5	3	7	18	11	61
22	183	142	492	475	225	16	5	3	6	14	11	50
23	278	149	450	525	219	16	5	3	6	11	14	40
24	285	142	397	501	204	16	5	3	6	9	49	40
25	255	162	354	535	190	16	5	3	6	7	60	40
26	248	149	324	578	183	12	5	3	6	6	31	40
27	225	142	285	595	183	12	5	3	6	6	31	31
28	219	225	240	616	175	16	5	3	6	6	24	31
29	211	.....	248	501	169	12	5	3	6	4	18	31
30	211	.....	300	467	169	12	5	3	6	4	14	23
31	211	.....	362	.....	162	.....	.....	3	.....	3	.....	23

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Daily discharge, in second-feet, of Little South Fork of Rubicon River at mouth, near Quintette, Cal., for 1909–1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1911.							1911.						
1	16	811	127	848	675	943	16	73	141	199	463	705	798
2	16	620	127	890	616	1,050	17	73	155	280	536	616	705
3	23	511	141	848	830	1,170	18	73	155	246	650	675	705
4	23	439	199	712	992	1,230	19	86	155	278	681	766	735
5	23	370	184	848	901	1,170	20	246	155	312	590	864	645
6	23	330	169	890	675	992	21	184	141	349	681	1,110	561
7	23	295	169	777	588	1,050	22	155	141	370	777	1,170	485
8	23	262	169	712	735	992	23	141	141	416	937	1,410	312
9	23	246	155	744	705	1,110	24	246	141	439	1,110	901	258
10	73	246	214	562	766	1,170	25	214	127	439	1,110	830	242
11	86	230	199	511	798	1,110	26	184	113	439	890	798	258
12	86	199	184	463	830	992	27	127	127	439	650	864	275
13	127	199	169	416	830	901	28	113	141	487	511	943	214
14	113	184	169	416	798	830	29	278	.....	590	511	830	199
15	99	155	184	416	766	798	30	1,710	.....	712	620	1,170	184
							31	1,230	.....	744	.....	901	.....

NOTE.—Daily discharge Jan. 15 to 21 and Apr. 23, 1910, estimated by engineers of United States Geological Survey from record of discharge of Little South Fork of Rubicon River below Gerle Creek near Quintette.

Monthly discharge of Little South Fork of Rubicon River at mouth, near Quintette, Cal., for 1909–1911.

[Drainage area, 57.8 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
1909.						
December	760	77	260	4.50	5.19	16,000
1910.						
January	415	142	204	3.53	4.07	12,500
February	225	136	158	2.73	2.84	8,780
March	552	240	380	6.57	7.57	23,400
April	616	380	476	8.24	9.19	28,300
May	433	162	292	5.05	5.82	18,000
June	155	12	49.6	.858	.96	2,950
July	12	5	5.9	.102	.12	363
August	5	3	3.9	.067	.08	240
September	16	5	7.4	.128	.14	440
October	60	3	12.0	.208	.24	738
November	60	2	15.2	.263	.29	904
December	562	16	120	2.08	2.40	7,380
The year	616	2	144	2.49	33.72	104,000
1911.						
January	1,710	16	191	3.30	3.80	11,700
February	811	113	248	4.29	4.47	13,800
March	744	127	298	5.16	5.95	18,300
April	1,110	416	692	12.0	13.39	41,200
May	1,410	588	841	14.6	16.83	51,700
June	1,230	184	736	12.7	14.17	43,800
The period	.....	.....	.....	.....	.....	180,000

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GERLE CREEK NEAR RUBICON SPRINGS, CAL.

Location.—At the outlet of Loon Lake, in the SE. ¼ NE. ¼ sec. 5, T. 13 N., R. 15 E., 3¾ miles southwest of Rubicon Springs.
Records available.—July 12, 1910, to August 31, 1911.
Drainage area.—9 square miles.
Gage.—Staff.
Channel.—Solid granite.
Discharge measurements.—Made from car and cable.
Winter flow.—Affected by ice.
Accuracy.—Results excellent except for winter.
Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

Daily discharge, in second-feet, of Gerle Creek near Rubicon Springs, Cal., for 1910–11.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.							1910.						
1	.....	14	20	15	3	18	16	12	18	18	41	3	31
2	.....	14	20	15	2	21	17	12	18	18	60	3	27
3	.....	17	20	15	1	24	18	13	17	18	52	3	23
4	.....	19	20	15	3	27	19	14	17	18	44	4	20
5	.....	19	20	15	3	31	20	14	17	17	36	5	18
6	.....	19	20	15	4	34	21	14	17	17	28	5	16
7	.....	19	19	17	4	37	22	14	17	17	20	6	14
8	.....	19	19	17	4	40	23	14	17	17	17	7	12
9	.....	19	19	16	4	43	24	14	17	17	16	8	11
10	.....	19	19	16	5	48	25	14	17	17	14	8	9
11	.....	18	19	16	5	52	26	14	17	16	12	7	8
12	7	18	19	15	5	56	27	14	17	16	10	6	7
13	8	18	18	15	4	59	28	14	18	16	8	9	7
14	10	18	18	15	4	42	29	14	20	16	6	12	6
15	12	18	18	15	4	35	30	14	20	16	5	15	6
							31	14	20	.....	4	.....	5

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	5	92	15	92	3	147	5	16
2	4	88	15	92	3	147	5	16
3	4	69	20	92	3	147	5	16
4	4	50	27	92	3	147	5	16
5	4	41	20	93	3	147	5	16
6	4	20	20	94	3	147	5	16
7	4	41	20	95	3	147	5	17
8	4	35	20	96	27	147	6	18
9	5	27	20	97	48	147	6	18
10	7	27	27	98	53	147	6	18
11	6	27	27	95	56	147	6	18
12	8	27	20	92	59	147	6	18
13	10	27	20	89	66	147	6	22
14	12	27	20	86	97	147	5	24
15	11	27	20	83	115	147	5	24
16	11	27	20	80	119	147	4	24
17	11	27	27	77	122	147	4	24
18	11	20	33	74	126	147	4	24
19	26	20	35	76	126	147	4	24
20	29	20	37	78	126	137	4	24
21	24	20	39	80	130	126	4	24
22	42	20	40	84	135	82	4	24
23	38	27	43	89	137	22	4	24
24	33	20	45	93	149	6	4	24
25	29	15	49	38	151	6	4	24
26	20	20	49	3	147	5	4	24
27	17	15	49	3	147	5	4	24
28	40	15	69	3	147	5	4	24
29	40	.....	76	3	147	5	11.5	24
30	40	.....	84	3	147	5	16	24
31	56	.....	92	.....	147	.....	16	24

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Monthly discharge of Gerle Creek near Rubicon Springs, Cal., for 1910–11.

[Drainage area, 9 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
1910.						
July 12–31	14	7	12.8	1.42	1.06	508
August	20	14	17.8	1.98	2.28	1,090
September	20	16	18.1	2.01	2.24	1,080
October	60	4	19.5	2.17	2.50	1,200
November	15	1	5.2	.578	.64	309
December	59	5	25.4	2.82	3.25	1,560
1911.						
January	56	4	18.0	2.00	2.31	1,110
February	92	15	31.8	3.53	3.68	1,770
March	92	15	35.4	3.93	4.53	2,180
April	98	3	72.3	8.03	8.96	4,300
May	151	3	88.5	9.83	11.33	5,440
June	147	5	107	11.9	13.28	6,370
July	16	4	5.69	.632	.73	350
August	24	16	21.2	2.36	2.72	1,300
The period						22,800

LITTLE SOUTH FORK DITCH AT SAWMILL NEAR QUINTETTE, CAL.

Location.—At flume across Little South Fork of Rubicon River about half a mile above sawmill and 15 miles northeast of Quintette.

Records available.—June 7, 1910, to July 31, 1911.

Gage.—

Discharge measurements.—

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

The intake of this canal is on Gerle Creek about 1¾ miles above the mouth; the course of the ditch is south until it crosses the Little Rubicon. It then flows down the valley to a point in the main Rubicon canyon, where it is carried by a tunnel into the Pilot Creek drainage area, a total distance of about 10 miles.

Daily discharge, in second-feet, of Little South Fork ditch at sawmill near Quintette, Cal., for 1910–11.

Day.	June.	July.	Aug.	Sept.	Oct.	Nov.	Day.	June.	July.	Aug.	Sept.	Oct.	Nov.
1910.							1910.						
1	.....	6	8	13.4	12	1.7	16	16	8	12	13.4	9.9	.....
2	.....	8	8	13.4	12	1.7	17	16	8	12	12.0	15.2	.....
3	.....	8	8	13.4	12	.7	18	14	8	12	9.9	15.2	.....
4	.....	8	12	13.4	12	.3	19	14	10	12	13.4	15.2	.....
5	.....	6	12	13.4	12	.7	20	14	10	12	13.4	15.2	.....
6	.....	6	12	13.4	9.9	.7	21	14	10	12	12	15.2	.....
7	8	6	12	13.4	9.9	.7	22	12	10	12	12	13.4	.....
8	14	6	12	13.4	9.9	.7	23	12	10	12	12	12	.....
9	18	6	12	13.4	9.9	.....	24	10	10	12	12	12	.....
10	18	6	12	13.4	9.9	.....	25	10	8	12	12	9.9	.....
11	18	4	12	13.4	12	.....	26	10	8	12	12	8.2	.....
12	18	4	12	13.4	12	.....	27	8	8	12	12	4.9	.....
13	16	4	12	13.4	9.9	.....	28	8	8	12	12	3.9	.....
14	18	4	12	13.4	9.9	.....	29	8	8	14	12	2.5	.....
15	16	8	12	13.4	9.9	.....	30	8	8	14	12	2.5	.....
							31	.....	8	14	.....	2.5	.....

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Daily discharge, in second-feet, of Little South Fork ditch at sawmill near Quintette, Cal., for 1910–11—Continued.

Day.	July.	Aug.	Day.	July.	Aug.	Day.	July.	Aug.
1911.			1911.			1911.		
1		14.0	11	12.2	12.2	21	14	14
2		12.2	12	12.2	12.2	22	14	14
3		12.2	13	14.0	10.5	23	12.2	14
4		12.2	14	12.2	14	24	12.2	14
5		10.5	15	12.2	14	25	12.2	14
6		10.5	16	12.2	14	26	10.5	14
7	12.2	10.5	17	10.5	14	27	10.5	14
8	12.2	10.5	18	8.7	14	28	8.7	12.2
9	12.2	10.5	19	8.7	14	29	8.7	12.2
10	12.2	12.2	20	7	14	30	15.7	12.2
						31	15.7	12.2

NOTE.—Discharge July 6, 1910, interpolated by engineers of United States Geological Survey. Ditch dry Nov. 9, 1910, to July 6, 1911.

Monthly discharge of Little South Fork ditch at sawmill near Quintette, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
June 7–30	18	8	13.2	628
July	10	4	7.4	455
August	14	8	11.8	726
September	13.4	12	12.8	762
October	15.2	2.5	10.4	640
November	1.7	.0	.24	14
December	.0	.0	.00	0
The period				3,220
1911.				
January	0.0	0.0	0.0	0
February	.0	.0	.0	0
March	.0	.0	.0	0
April	.0	.0	.0	0
May	.0	.0	.0	0
June	.0	.0	.0	0
July	15.7	.0	9.5	584
August	14.0	10.5	12.7	781
The period				1,360

PILOT CREEK NEAR QUINTETTE, CAL.

Location.—At Bacchi road crossing, in the NW. ¼ NW. ¼ sec. 10, T. 12 N., R. 12 E., about three-fourths of a mile southwest of Bacchi and 4 miles east of Quintette.

Records available.—February 24, 1910, to August 31, 1911.

Drainage area.—18.7 square miles; the natural run-off from the basin is increased by water diverted from Gerle Creek.

Gage.—Staff.

Channel.—Compact gravel.

Discharge measurements.—Made from car and cable.

Diversions.—Pilot Creek ditch.

Accuracy.—Results excellent.

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

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Daily discharge, in second-feet, of Pilot Creek near Quintette, Cal., for 1910–11.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.											
1	.....	76	116	47	15	7	7	6	6	4	4
2	.....	76	132	47	15	7	7	4	6	4	4
3	.....	88	132	41	11	7	7	4	6	4	36
4	.....	101	150	47	11	7	7	4	6	4	28
5	.....	116	150	41	11	7	7	4	6	4	12
6	.....	116	150	41	11	7	7	4	6	4	8
7	.....	116	150	41	11	7	7	4	6	4	12
8	.....	116	132	35	11	7	7	4	6	4	8
9	.....	132	132	35	11	7	7	4	6	4	8
10	.....	132	132	35	11	7	7	4	6	4	8
11	.....	132	150	35	11	7	7	4	8	6	36
12	.....	132	132	35	11	7	7	4	12	8	16
13	.....	150	116	30	7	7	7	6	12	4	12
14	.....	150	116	30	7	7	7	6	8	4	8
15	.....	150	101	30	7	7	7	8	8	4	8
16	.....	132	101	30	7	7	7	36	8	4	6
17	.....	132	101	25	7	7	7	16	8	4	6
18	.....	170	101	25	7	7	7	12	12	6	6
19	.....	261	101	25	7	7	7	12	12	4	6
20	.....	343	88	25	7	7	7	12	12	4	6
21	.....	300	88	25	7	7	7	12	12	4	6
22	.....	278	76	25	7	7	7	12	12	4	6
23	.....	261	76	20	7	7	7	12	12	4	4
24	35	212	76	20	7	7	7	8	8	4	4
25	76	191	66	20	7	7	7	8	8	16	4
26	66	170	55	20	7	7	7	8	6	6	4
27	66	150	47	20	7	7	7	6	6	6	4
28	66	132	66	20	7	7	7	6	4	6	4
29	.....	116	55	20	7	7	7	6	4	4	4
30	.....	116	55	20	7	7	7	6	4	4	4
31	.....	101	.....	15	.....	7	7	.....	4	.....	4

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	4	370	44	244	144	84	22	6
2	6	268	44	268	144	84	22	6
3	6	220	44	268	144	84	22	6
4	8	200	72	244	144	72	22	6
5	4	160	72	584	180	72	12	6
6	4	144	84	506	160	72	12	6
7	4	112	112	402	144	72	12	6
8	4	112	160	316	144	72	12	6
9	8	96	144	316	128	62	12	6
10	22	84	144	292	128	62	12	6
11	12	84	128	268	128	44	12	6
12	62	72	128	220	128	44	12	6
13	96	72	112	200	128	44	12	6
14	200	72	112	180	112	44	12	6
15	72	62	112	180	112	36	8	6
16	84	52	112	160	112	36	8	6
17	72	52	112	160	96	36	8	6
18	28	52	112	180	112	36	8	6
19	22	52	112	200	96	36	8	6
20	112	52	128	200	96	28	8	6
21	128	52	128	200	96	28	8	6
22	72	52	144	200	112	28	8	6
23	62	44	144	220	112	28	8	6
24	244	44	160	220	96	28	8	6
25	316	44	160	244	96	28	8	6
26	180	44	160	220	84	28	8	6
27	128	44	160	200	84	22	8	6
28	112	44	180	180	84	22	8	6
29	200	.....	200	160	84	22	8	6
30	784	.....	200	160	96	22	8	6
31	744	.....	220	.....	96	.....	6	6

NOTE.—Discharge Dec. 31, 1910, interpolated by engineers of United States Geological Survey.

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Monthly discharge of Pilot Creek near Quintette, Cal., for 1910–11.

[Drainage area, 18.7 square miles.]

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
February 24–8	76	35	61.8	613
March	343	76	156	9,590
April	150	47	105	6,250
May	47	15	29.8	1,830
June	15	7	8.9	530
July	7	7	7.0	430
August	7	7	7.0	430
September	36	4	8.1	482
October	12	4	7.7	473
November	16	4	4.9	292
December	36	4	9.2	566
The period				21,500
1911.				
January	784	4	123	7,560
February	370	44	98.4	5,460
March	220	44	127	7,810
April	584	160	246	14,600
May	180	84	117	7,190
June	84	22	45.9	2,730
July	22	6	11.0	676
August	6	6	6.0	369
The period				46,400

PILOT CREEK DITCH NEAR QUINTETTE, CAL.

Location.—Just south of the gaging station on Pilot Creek.

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

The amount diverted by the ditch is added to the flow at the Bacchi road crossing to determine the total run-off from the drainage area of the creek above this point.

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Daily discharge, in second-feet, of Pilot Creek ditch near Quintette, Cal., for 1910–11.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.											
1	.....	11	11	13	11	9	8	11	14	5	7
2	.....	11	11	13	11	11	8	11	14	5	7
3	.....	11	11	13	14	11	8	11	14	4	14
4	.....	11	0	13	14	11	8	14	14	4	11
5	.....	11	0	13	14	11	9	14	14	4	11
6	.....	11	0	13	14	11	9	11	14	4	9
7	.....	11	0	13	14	9	9	14	14	4	9
8	.....	11	8	13	14	9	9	14	14	4	7
9	.....	13	6	11	14	9	9	14	14	7	7
10	.....	13	6	13	13	8	9	14	14	5	7
11	.....	13	8	11	13	8	9	14	17	5	14
12	.....	13	6	11	13	8	9	14	17	11	9
13	.....	13	6	13	13	8	9	14	14	7	9
14	.....	13	6	13	13	6	9	14	14	7	9
15	.....	13	5	13	13	6	9	17	14	5	9
16	.....	13	5	13	13	8	9	14	14	5	7
17	.....	13	5	13	13	8	9	11	14	5	7
18	.....	13	5	13	11	8	9	11	14	7	7
19	.....	13	5	13	11	8	9	9	14	7	7
20	.....	15	5	13	11	9	9	9	14	7	7
21	.....	13	5	13	11	9	9	9	14	5	7
22	.....	11	5	13	11	9	9	9	14	5	7
23	.....	11	5	13	11	9	9	9	14	7	7
24	.....	11	4	13	11	9	9	9	14	5	7
25	11	11	4	13	11	9	9	11	14	14	7
26	11	9	13	13	9	9	9	11	11	9	5
27	11	11	13	13	9	9	9	14	11	9	5
28	11	11	13	13	9	9	9	14	9	7	4
29	.....	11	13	13	9	9	9	14	7	7	5
30	.....	11	13	13	9	8	9	14	7	7	5
31	.....	11	.....	13	.....	8	9	.....	5	.....	4

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	4	.....	.....	.....	.....	0	7	9
2	5	.....	.....	.....	.....	0	7	9
3	4	.....	.....	.....	.....	0	7	9
4	3	.....	.....	.....	.....	0	7	9
5	5	.....	.....	.....	.....	0	11	9
6	5	.....	.....	.....	.....	0	11	9
7	5	.....	.....	.....	.....	0	11	9
8	5	.....	.....	.....	.....	0	11	9
9	11	.....	.....	.....	.....	0	11	9
10	11	.....	.....	.....	.....	0	11	9
11	9	.....	.....	.....	.....	9	14	9
12	14	.....	.....	.....	.....	9	14	9
13	0	.....	.....	.....	.....	9	11	9
14	0	.....	.....	.....	.....	9	11	9
15	0	.....	.....	.....	.....	9	14	9
16	0	.....	.....	.....	.....	9	11	9
17	0	.....	.....	.....	.....	9	11	9
18	0	.....	.....	.....	.....	9	11	9
19	0	.....	.....	.....	.....	7	11	7
20	0	.....	.....	.....	.....	7	11	7
21	0	.....	.....	.....	.....	7	11	7
22	0	.....	.....	.....	.....	7	11	7
23	0	.....	.....	.....	.....	7	11	7
24	0	.....	.....	.....	.....	7	11	7
25	0	.....	.....	.....	.....	7	11	7
26	0	.....	.....	.....	.....	7	11	7
27	0	.....	.....	.....	.....	7	11	7
28	0	.....	.....	.....	.....	7	9	7
29	0	.....	.....	.....	.....	7	9	7
30	0	.....	.....	.....	.....	7	9	7
31	0	.....	.....	.....	.....	.....	9	5

NOTE.—Ditch dry Jan. 13 to June 10, 1911.

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Monthly discharge of Pilot Creek ditch near Quintette, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
March	15	9	11.8	726
April	13	0	6.6	393
May	13	11	12.8	787
June	14	9	11.9	708
July	11	6	8.8	541
August	9	8	8.9	547
September	17	9	12.3	732
October	17	5	13.1	806
November	14	4	6.2	369
December	14	4	7.6	467
The period				6,080
1911.				
January	14	0	2.6	160
February	0	0	.0	0
March	0	0	.0	0
April	0	0	.0	0
May	0	0	.0	0
June	9	0	5.2	309
July	14	7	10.5	646
August	9	5	8.1	498
The period				1,610

SOUTH FORK OF AMERICAN RIVER AT KYBURZ, CAL.

Location.—At Nielson's ranch (Kyburz post office), in the NE. ¼ sec. 28, T. 11 N., R. 15 E., half a mile above junction with Silver Fork and half a mile below Slippery Ford.

Records available.—April 11, 1906, to September 1, 1906, and September 1, 1907, to December 14, 1907.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Sand and gravel; fairly smooth.

Discharge measurements.—Made from a car and cable at gage.

Artificial control.—Flow practically controlled by storage at Echo Lake.

Accuracy.—Results good.

Cooperation.—Record of daily discharge furnished by Duryea, Haehl & Gilman, of San Francisco, Cal.

Daily discharge, in second-feet, of South Fork of American River at Kyburz, Cal., for 1906–1907.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1906.							1906.						
1	.....	284	465	1,800	198	171	16	230	520	1,690	715	176	.....
2	.....	375	503	a1,530	202	.....	17	270	520	1,630	560	176	.....
3	.....	531	520	1,260	196	.....	18	260	606	1,670	512	176	.....
4	.....	560	920	2,360	189	.....	19	271	695	1,890	460	176	.....
5	.....	912	795	1,750	a 190	.....	20	250	695	1,660	445	176	.....
6	.....	795	670	970	190	.....	21	359	695	2,010	a 425	176	.....
7	.....	770	a 606	1,250	189	.....	22	500	645	1,740	a 405	174	.....
8	.....	795	542	986	183	.....	23	a 360	520	1,530	385	173	.....
9	.....	814	1,370	935	187	.....	24	285	560	1,750	389	173	.....
10	.....	907	1,330	868	186	.....	25	240	585	1,240	386	172	.....
11	199	1,040	1,800	823	182	.....	26	240	570	1,240	325	171	.....
12	190	670	1,750	935	181	.....	27	260	585	1,000	314	172	.....
13	191	625	1,270	729	180	.....	28	240	464	986	259	172	.....
14	195	740	1,550	832	179	.....	29	a 250	416	1,060	a 234	172	.....
15	a 230	645	1,130	628	178	.....	30	260	403	880	209	172	.....
							31	.....	425	.....	202	172	.....

a Discharge estimated or interpolated by engineers of the United States Geological Survey from record of discharge of American River at Fairoaks and South Fork of American River near Kyburz.

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Daily discharge, in second-feet, of South Fork of American River at Kyburz, Cal., for 1906–1907—Continued.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1907.					1907.				
1	58	a 26	44	30	16	39	a 20	20	.....
2	58	a 25	40	20	17	40	a 20	20	.....
3	55	25	32	32	18	38	20	20	.....
4	a 56	23	32	a 31	19	a 36	23	20	.....
5	a 57	23	30	a 31	20	a 33	35	20	.....
6	58	23	a 28	30	21	a 30	28	21	.....
7	62	20	a 25	52	22	28	40	21	.....
8	60	20	23	38	23	28	a 41	22	.....
9	56	a 25	23	30	24	28	42	20	.....
10	55	30	20	a 80	25	28	52	20	.....
11	a 51	23	20	a 70	26	28	44	20	.....
12	a 46	23	20	a 60	27	28	60	19	.....
13	42	20	a 20	60	28	a 28	72	19	.....
14	40	20	a 20	30	29	28	a 65	18	.....
15	40	a 20	20	.....	30	26	a 58	19	.....
					31	.....	a 51	.....	.....

a Discharge estimated or interpolated by engineers of United States Geological Survey from records of discharge of American River at Fair oaks and South Fork of American River near Kyburz.

Monthly discharge of South Fork of American River at Kyburz, Cal., for 1906–7.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1906.				
April 11–30	500	190	264	10,500
May	1,040	284	625	38,400
June	2,010	465	1,240	73,800
July	2,360	202	770	47,300
August	202	171	180	11,100
1907.				
September	62	26	42.0	2,500
October	72	20	32.8	2,020
November	44	18	23.2	1,380
December 1–14	80	20	42.4	1,180

SOUTH FORK OF AMERICAN RIVER BELOW SILVER FORK, AT KYBURZ, CAL.

Location.—At the bridge just below the mouth of Silver Fork directly above the intake of Eldorado canal and about half a mile below Kyburz post office.

Records available.—February 25, 1906, to August 4, 1906.

Drainage area.—Not measured.

Gage.—Vertical staff on right pier of bridge.

Channel.—Contains bowlders; rough.

Discharge measurements.—Made from bridge.

Artificial control.—Flow partly regulated by storage at Echo and Silver lakes.

Accuracy.—Results fair.

Cooperation.—Record of daily discharge furnished by Duryea, Haehl & Gilman, of San Francisco.

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Daily discharge, in second-feet, of South Fork of American River below Silver Fork, at Kyburz, Cal., for 1906.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	.....	191	612	1,190	1,590	3,200	516
2	.....	a 208	478	1,300	1,380	a 2,720	470
3	.....	225	492	1,850	1,820	2,240	490
4	.....	a 206	390	1,750	2,500	2,940	459
5	.....	a 187	350	2,560	2,220	2,540	.....
6	.....	168	469	2,010	1,680	1,900	.....
7	.....	234	478	2,010	1,590	2,610	.....
8	.....	307	612	2,100	1,640	a 2,000	.....
9	.....	350	711	2,500	3,510	1,840	.....
10	.....	345	670	2,260	3,540	1,700	.....
11	.....	a 488	676	2,500	4,880	1,630	.....
12	.....	632	565	1,820	4,840	1,780	.....
13	.....	478	670	2,070	3,200	1,850	.....
14	.....	375	740	2,070	3,280	1,580	.....
15	.....	a 355	1,020	2,100	2,940	1,180	.....
16	.....	a 335	1,020	1,600	4,040	1,220	.....
17	.....	a 315	1,080	1,750	3,800	1,140	.....
18	.....	296	1,060	1,850	4,060	1,030	.....
19	.....	275	a 1,080	2,310	4,630	958	.....
20	.....	239	a 1,050	1,900	3,770	a 958	.....
21	.....	286	1,370	1,900	4,200	a 958	.....
22	.....	386	a 1,800	1,750	3,380	a 958	.....
23	.....	442	1,600	1,590	2,600	958	.....
24	.....	652	860	1,540	2,700	923	.....
25	267	670	728	1,820	2,710	882	.....
26	238	612	728	1,600	2,620	845	.....
27	.....	531	790	1,900	1,820	825	.....
28	239	442	670	1,360	1,640	667	.....
29	.....	472	a 730	1,260	1,690	a 623	.....
30	.....	478	790	1,280	1,750	579	.....
31	.....	750	.....	1,360	.....	534	.....

a Discharge estimated or interpolated by engineers of United States Geological Survey from records of discharge of American River at Fairoaks and South Fork of American River at Kyburz.

Monthly discharge of South Fork of American River below Silver Fork, at Kyburz, Cal., for 1906.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March	750	168	385	23,700
April	1,800	350	810	48,200
May	2,560	1,190	1,830	113,000
June	4,880	1,380	2,870	171,000
July	3,200	534	1,480	91,000

SOUTH FORK OF AMERICAN RIVER NEAR KYBURZ, CAL.

Location.—About half a mile below intake of Eldorado canal and mouth of Silver Fork and 1 mile below Kyburz post office.

Records available.—August 31, 1907, to December 14, 1907.

Drainage area.—Not measured.

Gage.—Recording; on left bank.

Discharge measurements.—Made from car and cable.

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Diversions and storage.—Flow partly regulated by storage at Echo and Silver lakes. The Eldorado canal, which supplies water for irrigation and mining, carries about 60 second-feet during the irrigation season (June 15 to Sept. 30) and about 30 second-feet during the remainder of the year.

Accuracy.—Results are good.

Cooperation.—Record of daily discharge furnished by Duryea, Haehl & Gilman. of San Francisco, Cal.

Daily discharge, in second-feet, of South Fork of American River near Kyburz, Cal., for 1907.

Day.	Sept.	Oct.	Nov.	Dec..	Day.	Sept.	Oct.	Nov.	Dec.
1	85	a 43	48	20	16	40	a 19	42	.....
2	80	a 37	40	20	17	38	a 18	42	.....
3	a 86	30	35	20	18	32	18	42	.....
4	a 92	20	30	a 20	19	a 29	20	42	.....
5	98	20	28	a 20	20	a 26	35	42	.....
6	89	20	37	70	21	a 23	30	41	.....
7	82	20	46	88	22	20	40	41	.....
8	80	20	55	70	23	20	a 42	41	.....
9	75	a 25	53	50	24	16	45	38	.....
10	75	30	50	a 120	25	25	63	40	.....
11	a 71	20	50	a 90	26	50	52	38	.....
12	a 66	20	48	70	27	50	65	36	.....
13	62	20	47	80	28	a 50	78	32	.....
14	56	20	46	35	29	49	a 71	30	.....
15	55	a 20	45	.....	30	50	a 63	30	.....
					31	.....	a 55	.....	.....

a Estimated or interpolated by engineers of United States Geological Survey from record of discharge of American River at Fairoaks and of South Fork of American River at Kyburz.

Monthly discharge of South Fork of American River near Kyburz, Cal., for 1907.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
September	98	15	55.3	3,290
October	78	18	34.8	2,140
November	55	28	41.2	2,450
December 1-14	120	20	55.2	1,530

SOUTH FORK OF AMERICAN RIVER NEAR PLACERVILLE, CAL.

Location.—Below highway bridge at Chilli Bar, in the SE. ¼ sec. 26, T. 11 N., R. 10 E., about 1,000 feet below Big Canyon Creek, and 3 miles northwest of Placerville.

Records available.—August 11 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Three sections on right bank about 1,000 feet below bridge.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from downstream side of bridge, or by wading.

Diversions.—Just below the mouth of Silver Fork there is a diversion for irrigation, mining, and municipal supply for Placerville. Power is developed near the mouth of Rock Creek by the Western States Gas & Electric Co. Echo and Silver lakes are used as storage reservoirs.

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Discharge measurements of South Fork of American River near Placerville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 11[a]	F. C. Ebert	4.58	307
Sept. 24[b]	do	3.68	98

[a] Made from bridge. [b] Made by wading about 250 feet above gage.

Daily gage height, in feet, of South Fork of American River near Placerville, Cal., for 1911.

[Frank Baldschun, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.9	3.75	3.8	4.0	16	4.4	3.7	3.85	4.45	3.9
2	.....	3.9	3.8	3.8	4.0	17	4.35	3.7	3.85	4.3	4.1
3	.....	3.9	3.85	3.75	4.0	18	4.3	3.7	3.8	4.2	4.0
4	.....	3.85	3.85	3.75	4.0	19	4.2	3.7	3.75	4.1	3.9
5	.....	3.85	3.9	3.75	4.0	20	4.2	3.7	3.75	4.1	3.9
6	.....	3.85	3.9	3.75	4.0	21	4.5	3.65	3.75	4.1	3.9
7	.....	3.85	3.9	3.8	4.0	22	4.15	3.65	3.7	4.1	3.85
8	.....	3.85	3.85	3.85	4.0	23	4.05	3.7	3.7	4.05	3.85
9	.....	3.8	3.9	3.85	4.0	24	4.05	3.7	3.7	4.05	4.2
10	.....	3.8	4.0	4.6	4.0	25	4.05	3.7	3.75	4.05	3.9
11	4.6	3.8	3.95	4.75	3.95	26	4.0	3.8	3.75	4.05	3.9
12	4.55	3.8	3.95	4.2	3.95	27	4.15	3.8	3.85	4.0	3.9
13	4.5	3.75	3.9	4.2	3.95	28	4.0	3.7	3.9	4.0	4.25
14	4.45	3.75	3.9	4.15	3.95	29	3.95	3.65	3.85	4.0	4.2
15	4.4	3.7	3.85	4.1	3.95	30	3.95	3.75	3.8	4.0	4.2
						31	3.95	.....	3.8	.....	4.2

CACHE CREEK AT LOWER LAKE, CAL.

Location.—Above highway bridge near outlet of Clear Lake, in the SE. ¼ SE. ¼ sec. 34, T. 13 N., R. 7 W., just above Seigler Creek and 1 mile north of Lower Lake.

Records available.—January 1, 1901, to December 31, 1911.

Drainage area.—500 square miles.

Gage.—Vertical staff on left bank 400 feet above bridge. Previous to March 26, 1903, the gage was located at the bridge. The original datum has not been changed.

Channel.—Gravel and permanent.

Discharge measurements.—Made from car and cable 100 feet below gage.

Accuracy.—Results are good.

Discharge measurements of Cache Creek at Lower Lake, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 30	E. O. Christiansen	2.61	39
Dec. 2	S. C. Whipple	2.43	25

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Daily gage height, in feet, of Cache Creek at Lower Lake, Cal., for 1911.

[J. R. Anderson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.85	3.85	4.65	6.8	5.8	5.0	4.25	3.7	3.1	2.75	2.60	2.50
2	1.9	4.1	4.65	6.8	5.8	5.0	4.25	3.65	3.1	2.75	2.60	2.45
3	1.85	4.1	5.55	6.75	5.75	4.95	4.25	3.65	3.1	2.8	2.60	2.45
4	1.85	4.15	5.1	6.6	5.75	4.9	4.2	3.6	3.1	2.7	2.60	2.45
5	1.85	4.2	5.65	6.75	5.75	4.9	4.2	3.6	3.05	2.7	2.58	2.40
6	1.85	4.25	7.4	6.75	5.75	4.9	4.15	3.55	3.0	2.7	2.58	2.55
7	1.9	4.25	7.8	6.7	5.75	4.85	4.15	3.55	3.0	2.7	2.65	2.55
8	1.9	4.25	7.9	6.6	5.7	4.85	4.15	3.5	3.0	2.65	2.60	2.50
9	2.1	4.3	7.65	6.6	5.6	4.8	4.1	3.5	2.95	2.75	2.55	2.50
10	1.8	4.3	7.8	6.6	5.55	4.8	4.1	3.5	2.9	2.7	2.80	2.50
11	2.0	4.4	7.8	6.75	5.5	4.75	4.1	3.45	2.9	2.65	2.55	2.45
12	1.95	4.45	7.75	6.5	5.6	4.75	4.05	3.45	2.9	2.65	2.52	2.45
13	2.05	4.7	7.75	6.4	5.5	4.75	4.0	3.4	2.85	2.7	2.50	2.45
14	2.05	4.6	7.8	6.35	5.45	4.7	4.0	3.4	2.9	2.7	2.52	2.45
15	2.1	4.65	7.85	6.35	5.5	4.7	4.0	3.35	2.9	2.65	2.60	2.45
16	2.15	4.65	7.75	6.3	5.4	4.7	4.0	3.4	2.85	2.65	2.55	2.50
17	2.15	4.75	7.65	6.3	5.35	4.65	4.0	3.35	2.85	2.65	2.55	2.50
18	2.15	4.7	7.6	6.3	5.4	4.65	3.95	3.35	2.85	2.65	2.55	2.50
19	2.3	4.7	7.5	6.2	5.3	4.65	3.9	3.3	2.8	2.65	2.55	2.52
20	2.5	4.7	7.45	6.15	5.25	4.6	3.9	3.3	2.8	2.65	2.52	2.48
21	2.55	4.7	7.4	6.1	5.25	4.55	3.9	3.25	2.8	2.6	2.52	2.45
22	2.55	4.7	7.35	6.05	5.2	4.55	3.85	3.25	2.8	2.65	2.52	2.45
23	2.55	4.75	7.35	6.05	5.25	4.5	3.8	3.2	2.8	2.65	2.52	2.45
24	2.6	4.75	7.4	6.0	5.25	4.5	3.8	3.2	2.75	2.65	2.50	2.45
25	2.7	4.8	7.25	5.95	5.2	4.45	3.8	3.2	2.75	2.7	2.50	2.42
26	2.7	4.7	7.15	6.0	5.1	4.4	3.75	3.15	2.75	2.6	2.52	2.40
27	3.25	4.65	7.1	5.95	5.1	4.4	3.75	3.15	2.75	2.6	2.52	2.52
28	3.45	4.6	7.0	5.9	5.05	4.4	3.75	3.15	2.75	2.6	2.55	2.48
29	3.6	.....	6.95	5.85	5.1	4.35	3.7	3.1	2.75	2.6	2.52	2.40
30	3.8	.....	6.9	5.85	5.1	4.3	3.7	3.1	2.85	2.6	2.50	2.45
31	3.8	.....	6.8	.....	5.0	.....	3.7	3.1	.....	2.62	.....	2.50

Daily discharge, in second-feet, of Cache Creek at Lower Lake, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4	240	432	1,060	750	520	332	208	99	54	39	30
2	5	296	432	1,060	750	520	332	198	99	54	39	26
3	4	296	675	1,050	735	506	332	198	99	60	39	26
4	4	308	547	999	735	494	320	188	99	49	39	26
5	4	320	705	1,050	735	494	320	188	92	49	37	22
6	4	332	1,260	1,050	735	494	308	178	85	49	37	34
7	5	332	1,390	1,030	735	482	308	178	85	49	44	34
8	5	332	1,430	999	720	482	308	169	85	44	39	30
9	9	344	1,340	999	690	469	296	169	78	54	34	30
10	3	344	1,390	999	675	469	296	169	72	49	60	30
11	7	369	1,390	1,050	660	456	296	160	72	44	34	26
12	6	382	1,380	967	690	456	284	160	72	44	32	26
13	8	444	1,380	935	660	456	273	150	66	49	30	26
14	8	419	1,390	919	646	444	273	150	72	49	32	26
15	9	432	1,410	919	660	444	273	141	72	44	39	26
16	10	432	1,380	903	631	444	273	150	66	44	34	30
17	10	456	1,340	903	617	432	273	141	66	44	34	30
18	10	444	1,320	903	631	432	262	141	66	44	34	30
19	16	444	1,290	872	603	432	251	132	60	44	34	32
20	30	444	1,270	858	589	419	251	132	60	44	32	28
21	34	444	1,260	841	589	406	251	124	60	39	32	26
22	34	444	1,240	826	575	406	240	124	60	44	32	26
23	34	456	1,240	826	589	395	229	115	60	44	32	26
24	39	456	1,260	810	589	394	229	115	54	44	30	26
25	49	469	1,210	795	575	382	229	115	54	49	30	24
26	49	444	1,180	810	547	369	218	107	54	39	32	22
27	124	432	1,160	795	547	369	218	107	54	39	32	32
28	160	419	1,130	780	534	369	218	107	54	39	34	28
29	188	.....	1,110	765	547	356	208	99	54	39	32	22
30	229	.....	1,100	765	547	344	208	99	66	39	30	26
31	229	.....	1,060	.....	520	.....	208	99	.....	41	.....	30

NOTE.—Daily discharge determined from a well-defined rating curve.

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Monthly discharge of Cache Creek at Lower Lake, Cal., for 1911.

[Drainage area, 500 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	229	3	42.9	0.086	0.10	2,640	A.
February	469	240	392	.784	.82	21,800	A.
March	1,430	432	1,160	2.32	2.68	71,300	A.
April	1,060	765	918	1.84	2.05	54,600	A.
May	750	520	639	1.28	1.48	39,300	A.
June	520	344	438	.876	.98	26,100	A.
July	332	208	268	.536	.62	16,500	A.
August	208	99	146	.292	.34	8,980	A.
September	99	54	71.2	.142	.16	4,240	A.
October	60	39	45.7	.091	.10	2,810	A.
November	60	30	35.3	.071	.08	2,100	A
December	34	22	27.6	.055	.06	1,700	A.
The year	1,410	3	348	.696	9.47	252,000	

CACHE CREEK AT YOLO, CAL.

Location.—At highway bridge one-half mile south of Yolo, in Río Jesús María land grant, 1,000 feet above Southern Pacific Railroad bridge at Yolo.

Records available.—January 1, 1903, to December 31, 1911.

Drainage area.—1,230 square miles.

Gage.—Staff in four sections. Lower section is vertical and fastened to pile under bridge. Second section, which is inclined, is on right bank 30 feet above bridge. Third section is vertical and fastened to cottonwood tree on right bank 70 feet above bridge. Upper section is bolted to upper end of right abutment. This gage was installed October 2, 1904, at the same datum as the original gage at the bridge.

Channel.—Sand and gravel and somewhat shifting.

Discharge measurements.—Made from bridge or by wading.

Diversions.—Numerous ditches take water for irrigation above the station.

Accuracy.—High-water estimates are fair. Otherwise the results are good.

Discharge measurements of Cache Creek at Yolo, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 16	J. E. Stewart	2.03	256
25	do	3.87	1,180
Mar. 20	do	5.45	1,890
May 8	do	3.38	814
July 10[a]	do	1.84	150
Oct. 11[b]	do	.40	0
Dec. 5[c]	Ebert and Lee		0

[a] Made by wading about 300 feet above gage. [b] Water standing in pools. [c] Creek dry.

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Daily gage height, in feet, of Cache Creek at Yolo, Cal., for 1911.

[Cornelia W. Bigelow, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	6.0	3.95	4.55	3.55	2.7	1.95	1.35	0.9	0.9
2	.....	5.5	4.4	4.5	3.5	2.65	1.95	1.35	.9	.9
3	.....	5.7	7.8	4.45	3.5	2.65	1.9	1.3	.9	.....
4	.....	5.0	9.95	4.4	3.5	2.6	1.9	1.3	.9	.....
5	.....	4.6	17.1	4.5	3.45	2.55	1.9	1.25	.....	.....
6	.....	4.4	17.5	5.4	3.45	2.55	1.9	1.25	.....	.....
7	.....	4.1	25.0	4.8	3.4	2.7	1.85	1.2	.....	.....
8	.....	3.9	16.6	4.55	3.4	2.65	1.8	1.2	.....	.....
9	.....	3.65	10.55	4.45	3.35	2.6	1.75	1.2	.....	.....
10	.....	3.5	8.9	4.4	3.3	2.55	1.75	1.2	.....	.....
11	.....	3.9	7.8	4.4	3.3	2.5	1.7	1.15	1.15	.....
12	.....	4.6	7.1	4.3	3.25	2.45	1.7	1.15	1.15	.....
13	.....	4.5	6.7	4.2	3.2	2.45	1.7	1.15	1.15	.....
14	2.15	4.4	6.35	4.15	3.1	2.4	1.7	1.1	1.1	.....
15	2.4	4.15	6.1	4.1	3.0	2.4	1.65	1.1	1.1	.....
16	2.1	3.95	6.0	4.1	2.95	2.35	1.65	1.1	1.1	.....
17	1.85	3.85	5.8	4.0	2.9	2.35	1.65	1.1	1.1	.....
18	1.6	3.75	5.7	3.95	2.9	2.3	1.65	1.05	1.1	.....
19	1.5	3.7	5.6	3.9	2.9	2.25	1.65	1.05	1.1	.....
20	4.9	3.65	5.5	3.85	2.85	2.25	1.6	1.05	1.1	.....
21	3.85	3.5	5.4	3.8	2.85	2.2	1.6	1.0	1.1	.....
22	2.7	3.45	5.2	3.75	2.85	2.2	1.6	1.0	1.1	.....
23	2.25	3.4	5.15	3.75	2.85	2.15	1.6	1.0	1.1	.....
24	2.2	3.35	5.1	3.7	2.85	2.1	1.6	1.0	1.05	.....
25	3.85	3.3	5.0	3.7	2.8	2.1	1.55	1.0	1.05	.....
26	3.4	3.3	4.9	3.7	2.8	2.05	1.55	.95	1.05	.....
27	3.3	3.25	4.8	3.65	2.8	2.0	1.5	.95	1.0	.....
28	10.4	3.2	4.75	3.65	2.8	2.0	1.45	.95	1.0	.....
29	12.45	.....	4.7	3.6	2.75	1.95	1.45	.95	.95	.....
30	8.35	.....	4.65	3.6	2.75	1.95	1.4	.9	.95	.....
31	9.15	.....	4.6	.....	2.7	.....	1.4	.9	.....	.....

NOTE.—All gage heights are considered reliable at this station, except from about May 12 to the first part of July. During this period the readings appear to have been partly estimated by the observer and partly read on a gage which was known to be 0.2 foot too high. These readings are all subject to an error of from 0.1 to 0.2 foot. Water standing in pools or creek dry Jan. 1–13, Sept. 5–10, and Oct. 3 to Dec. 31.

Daily discharge, in second-feet, of Cache Creek at Yolo, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	2,370	1,050	1,380	850	450	180	36	1	1	0	0
2	0	1,990	1,300	1,350	825	430	180	36	1	1	0	0
3	0	2,140	3,820	1,320	825	430	165	27	1	0	0	0
4	0	1,650	5,650	1,300	825	410	165	27	1	0	0	0
5	0	1,410	11,700	1,350	800	390	165	20	0	0	0	0
6	0	1,300	12,100	1,920	800	390	165	20	0	0	0	0
7	0	1,130	18,400	1,530	775	450	152	14	0	0	0	0
8	0	1,020	11,300	1,380	775	430	138	14	0	0	0	0
9	0	902	6,160	1,320	750	410	125	14.	0	0	0	0
10	0	835	4,760	1,300	725	390	125	14	0	0	0	0
11	0	1,020	3,820	1,300	725	370	112	10	10	0	0	0
12	0	1,410	3,250	1,240	700	350	112	10	10	0	0	0
13	0	1,350	2,930	1,180	675	350	112	10	10	0	0	0
14	288	1,300	2,650	1,160	630	330	112	7	7	0	0	0
15	375	1,160	2,450	1,130	585	330	100	7	7	0	0	0
16	270	1,050	2,370	1,130	562	312	100	7	7	0	0	0
17	190	1,000	2,220	1,080	540	312	100	7	7	0	0	0
18	120	950	2,140	1,050	540	295	100	5	7	0	0	0
19	95	925	2,060	1,020	540	278	100	5	7	0	0	0
20	1,590	902	1,990	1,000	518	278	88	5	7	0	0	0
21	1,000	835	1,920	975	518	260	88	3	7	0	0	0
22	490	812	1,780	950	518	260	88	3	7	0	0	0
23	322	790	1,750	950	518	242	88	3	7	0	0	0
24	305	768	1,720	925	518	225	88	3	5	0	0	0
25	1,000	745	1,650	925	495	225	77	3	5	0	0	0

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Daily discharge, in second-feet, of Cache Creek at Yolo, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26	790	745	1,590	925	495	210	77	2	5	0	0	0
27	745	722	1,530	902	495	195	66	2	3	0	0	0
28	6,030	700	1,500	902	495	195	56	2	3	0	0	0
29	7,770	.....	1,470	880	472	180	56	2	2	0	0	0
30	4,290	.....	1,440	880	472	180	45	1	2	0	0	0
31	4,970	.....	1,410	.....	450	.....	45	1	.....	0	.....	0

NOTE.—Daily discharge determined from two curves which are fairly well defined, except at high stages where theyare somewhat poorly defined and are applicable as follows: Jan. 1 to Apr. 30 and May 1 to Dec. 31, 1911. Discharge May 12 to about July 15 subject to 5 to 20 per cent error. The apparent rise June 7 is due to error of gage readings.

Monthly discharge of Cache Creek at Yolo, Cal., for 1911.

[Drainage area, 1,230 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	7,770	0	988	0.803	0.93	60,800	B.
February	2,370	700	1,140	.927	.97	63,300	B.
March	18,400	1,050	3,870	3.15	3.63	238,000	C.
April	1,920	880	1,160	.943	1.05	69,000	B.
May	850	450	626	.509	.59	38,500	C.
June	450	180	319	.259	.29	18,900	C.
July	180	45	109	.089	.10	6,700	C.
August	36	1	10.3	.0084	.01	633	D.
September	10	0	4.3	.0035	.004	256	D.
October	1	0	0.1	.0000	.000	4	
November	0	0	.0	.0000	.000	0	
December	0	0	.0	.0000	.000	0	
The year	18,400	0	685	.557	7.573	496,000	

PUTAH CREEK AT WINTERS, CAL.

Location.—Just below Southern Pacific Co.'s railroad bridge in Winters, in the Río de los Putos grant.

Records available.—September 26, 1905, to December 31, 1911.

Drainage area.—805 square miles.

Gage.—Staff in five sections on left bank, 600 feet below bridge. An auxiliary vertical staff on right bank is used for low water. The original gage datum has been maintained.

Channel.—Sand and gravel and somewhat shifting. Two channels at low water.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—With the exception of a small amount of water pumped for irrigation, there are no diversions above the station.

Accuracy.—Results are fair except for low water, which are only approximate. Beginning about May 17, 1911, a temporary dam was constructed across the creek 500 feet below the gages, ponding water for recreation purposes. This dam was partially destroyed October 2, 1911.

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Discharge measurements of Putah Creek at Winters, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 17	J. E. Stewart	5.79[a]	604
25	do	9.83[a]	3,660
Mar. 21	do	6.19[a]	848
May 8[b]	do	4.73[a]	212
31[d]	do	8.98[c]	95
July 10[d]	do	9.81[c]	21
Oct. 17[e]	do	4.57[c]	8.2

[a] North channel gage.
[b] Measurement by wading 400 feet below gage.
[c] South channel gage.
[d] Measurement by wading 500 feet below gage; affected by backwater from temporary dam.
[e] Measurement by wading 50 feet below gage.

Daily gage height, in feet, of Putah Creek at Winters, Cal., for 1911.

[Erna Wyatt, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.06	9.57	6.26	5.26	4.85	.....	.....	.....	.....	.....	4.58	4.67
2	4.06	8.88	6.32	5.23	4.84	.....	.....	.....	.....	.....	4.58	4.66
3	4.06	9.08	10.60	5.21	4.84	.....	.....	.....	.....	4.67	4.57	4.65
4	4.06	8.18	9.30	5.14	4.83	.....	.....	.....	.....	4.67	4.57	4.67
5	4.06	7.38	17.15	6.12	4.75	.....	.....	.....	.....	4.67	4.57	4.72
6	4.06	7.58	18.80	7.57	4.74	.....	.....	.....	.....	4.62	4.57	4.76
7	4.06	7.03	26.22	6.54	4.74	.....	.....	.....	.....	4.62	4.57	4.75
8	4.06	6.72	15.30	6.16	4.74	.....	.....	.....	.....	4.57	4.57	4.75
9	4.06	6.44	12.20	.....	4.74	.....	.....	.....	.....	4.77	4.62	4.75
10	4.07	6.25	9.20	6.44	4.75	.....	.....	.....	.....	4.57	4.67	4.72
11	4.13	9.88	9.00	6.09	4.84	.....	.....	.....	.....	4.57	4.67	4.72
12	4.24	7.98	8.27	5.89	4.79	.....	.....	.....	.....	4.57	4.77	4.72
13	7.78	9.38	7.67	5.74	4.76	.....	.....	.....	.....	4.52	4.82	4.72
14	10.58	7.98	7.38	5.59	4.76	.....	.....	.....	.....	4.52	4.82	4.72
15	9.38	7.28	7.13	5.52	4.74	.....	.....	.....	.....	4.47	4.77	4.72
16	6.44	6.74	6.99	5.44	4.74	.....	.....	.....	.....	4.47	4.66	4.72
17	5.79	6.54	6.76	5.37	.....	.....	.....	.....	.....	4.52	4.66	4.72
18	5.45	6.34	6.68	5.32	.....	.....	.....	.....	.....	4.52	4.66	4.72
19	5.35	6.22	6.44	.....	.....	.....	.....	.....	.....	4.47	4.57	4.72
20	15.20	6.07	6.29	5.15	.....	.....	.....	.....	.....	4.47	4.57	4.72
21	7.97	5.94	6.14	5.14	.....	.....	.....	.....	.....	4.47	.....	4.69
22	6.60	5.83	6.04	5.08	.....	.....	.....	.....	.....	4.47	4.67	4.69
23	6.04	5.76	5.94	5.04	.....	.....	.....	.....	.....	4.47	4.67	4.74
24	7.83	5.66	5.76	5.04	.....	.....	.....	.....	.....	4.57	4.67	4.74
25	9.38	5.62	5.72	4.99	.....	.....	.....	.....	.....	4.62	4.67	4.75
26	8.38	5.54	5.64	4.96	.....	.....	.....	.....	.....	4.62	4.67	4.75
27	8.38	5.49	5.56	4.94	.....	.....	.....	.....	.....	4.62	4.67	4.77
28	17.30	5.47	5.53	4.94	.....	.....	.....	.....	.....	4.62	4.67	4.77
29	15.30	.....	5.44	4.94	.....	.....	.....	.....	.....	4.62	4.67	4.77
30	12.48	.....	5.42	4.94	.....	.....	.....	.....	.....	4.62	4.67	4.77
31	13.30	.....	5.33	.....	.....	.....	.....	.....	.....	4.60	.....	4.87

NOTE.—Gage heights observed on North Channel gage Jan. 1 to May 22 (except Mar. 12 and 13, which were the same on both gages and June 19 to 24. Gage heights observed on south gage May 23 to June 18 and June 25 to Dec. 31. Gage heights about May 17 to Dec. 31 affected by back water from temporary dam constructed about 400 feet below the station to form a boating and swimming pool. The gage heights during most of the period May 17 to Oct. 2 were between 8 and 10 feet, and are omitted, since frequent changes in the dam render them useless as an index of the discharge. There was relatively little back water Oct. 3 to Dec. 31, and the relation of gage height to discharge was stable. Gage heights Mar. 5 to 7 determined from hydrograph.

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Daily discharge, in second-feet, of Putah Creek at Winters, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	28	3,590	889	389	245	.....	.....	.....	.....	20	9	17
2	28	2,950	928	377	242	.....	.....	.....	.....	20	9	16
3	28	3,130	4,600	369	242	.....	.....	.....	.....	17	8	15
4	28	2,340	3,340	344	239	.....	.....	.....	.....	17	8	17
5	28	1,680	12,500	807	218	.....	.....	.....	.....	17	8	22
6	28	1,840	15,000	1,830	215	.....	.....	.....	.....	12	8	27
7	28	1,420	28,300	1,070	215	.....	.....	.....	.....	12	8	26
8	28	1,200	9,960	831	215	.....	.....	.....	.....	8	8	26
9	28	1,010	6,280	920	215	.....	.....	.....	.....	28	12	26
10	29	882	3,240	1,010	218	.....	21	.....	.....	8	17	22
11	36	3,890	3,060	790	242	.....	.....	.....	.....	8	17	22
12	53	2,170	2,410	680	228	.....	.....	.....	.....	8	28	22
13	2,000	3,410	1,910	605	220	.....	.....	.....	.....	5	35	22
14	4,580	2,170	1,680	530	220	.....	.....	.....	.....	5	35	22
15	3,410	1,600	1,490	499	215	.....	.....	.....	.....	3	28	22
16	1,010	1,210	1,390	463	215	.....	.....	.....	.....	3	16	22
17	604	1,070	1,230	433	.....	.....	.....	.....	.....	5	16	22
18	432	941	1,170	413	.....	.....	.....	.....	.....	5	16	22
19	388	863	1,010	380	.....	.....	.....	.....	.....	3	8	22
20	9,330	767	908	348	.....	.....	.....	.....	.....	3	8	22
21	2,160	689	819	344	.....	.....	.....	.....	.....	3	12	19
22	1,120	676	762	323	.....	.....	.....	.....	.....	3	17	19
23	749	588	707	309	.....	.....	.....	.....	.....	3	17	25
24	2,040	535	615	309	.....	.....	.....	.....	.....	8	17	25
25	3,410	515	595	292	.....	.....	.....	.....	.....	12	17	26
26	2,510	475	555	281	.....	.....	.....	.....	.....	12	17	26
27	2,510	450	517	274	.....	.....	.....	.....	.....	12	17	28
28	12,800	442	504	274	.....	.....	.....	.....	.....	12	17	28
29	9,960	.....	463	274	.....	.....	.....	.....	.....	12	17	28
30	6,590	.....	454	274	.....	.....	.....	.....	.....	12	17	28
31	7,490	.....	417	.....	95	.....	.....	.....	.....	10	.....	41

NOTE.—Daily discharge based on three discharge rating curves applicable as follows; Jan. 1 to Mar. 20, fairly well defined; Mar. 21 to May 16, fairly well defined; Oct. 3 to Dec. 31, based on one measurement in 1911, and two in 1912, and not well defined. Discharge Oct. 1 and 2 estimated.

Monthly discharge of Putah Creek at Winters, Cal., for 1911.

[Drainage area, 805 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	12,800	28	2,390	2.97	3.42	147,000	C.
February	3,890	442	1,520	1.89	1.97	81,600	B.
March	28,300	417	3,470	4.31	4.97	213,000	C.
April	1,830	274	535	.665	.74	31,800	C.
May 1–16	245	215	225	.280	.17	7,140	C.
October	28	3	9.9	.012	.01	609	D.
November	35	8	15.6	.019	.02	898	D.
December	41	15	23.5	.029	.03	1,440	D.

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NORTHERN PACIFIC OCEAN DRAINAGE BASINS.

RUSSIAN RIVER BASIN.

RUSSIAN RIVER NEAR UKIAH, CAL.

Location.—At Bailey's bridge, in the Yokayo grant, just above junction with East Fork, 3 miles northeast of Ukiah.

Records available.—August 18 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Painted on left abutment of bridge.

Channel.—Sand and gravel; may shift slightly at high water.

Discharge measurements.—Made from bridge or by wading.

Discharge measurements of Russian River near Ukiah, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 18	E. O. Christiansen	3.12	0.5
Nov. 2	do	3.10	[a].2
Nov. 20[b]	Whipple and Stanley	3.25	.5

[a] Estimated. [b] Made by wading by engineers of Irrigation Investigations, Department of Agriculture.

Daily gage height, in feet, of Russian River near Ukiah, Cal., for 1911.

[W. F. Lawrance, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.10	2.95	3.14	3.16	16	.....	2.88	2.98	3.14	3.40
2	.....	3.10	3.00	3.10	3.20	17	.....	2.88	3.02	3.16	3.45
3	.....	3.11	2.96	3.10	3.30	18	.....	2.88	3.01	3.16	3.45
4	.....	3.12	2.96	3.10	3.30	19	3.11	2.88	3.04	3.16	3.40
5	.....	3.12	2.97	3.11	3.30	20	3.12	2.88	3.04	3.16	3.40
6	.....	3.11	2.96	3.11	3.32	21	3.05	2.88	3.04	3.20	3.38
7	.....	3.14	2.97	3.11	3.32	22	3.11	2.88	3.01	3.20	3.38
8	.....	3.14	2.96	3.11	3.35	23	3.14	2.88	3.04	3.20	3.38
9	.....	3.14	2.98	3.12	3.38	24	3.14	2.88	3.04	3.20	3.38
10	.....	3.12	2.98	3.14	3.38	25	3.14	2.88	3.04	3.20	3.38
11	.....	2.95	2.97	3.14	3.38	26	3.10	2.88	3.04	3.20	3.38
12	.....	2.95	2.97	3.14	3.38	27	3.10	2.88	3.04	3.18	3.51
13	.....	2.95	2.98	3.14	3.38	28	3.10	2.88	3.04	3.18	3.78
14	.....	2.88	2.98	3.14	3.38	29	3.10	2.88	3.04	3.18	3.70
15	.....	2.88	2.98	3.14	3.49	30	3.08	2.88	3.04	3.16	3.55
						31	3.10	.....	3.04	.....	3.75

RUSSIAN RIVER AT GEYSERVILLE, CAL.

Location.—At highway bridge, in the Tzabaco grant, half a mile northeast of Geyserville.

Records available.—December 5, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Painted on lower caisson of sixth pier from right end of bridge, with a vertical staff for low water.

Channel.—Gravel; smooth; section shifts slightly during high water. Overflow section on left bank.

Discharge measurements.—Made from upstream side of bridge and by wading.

Diversions.—Water is diverted from the South Eel to the East Fork of Russian River for use in power development at Potter Valley.

Estimates are withheld until additional measurements are available.

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Discharge measurements of Russian River at Geyserville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 4	J. E. Stewart	11.00	2,880
June 24[a]	E. A. Ingham	9.40	218
July 22[a]	....do	8.95	52
Aug. 18	E. O. Christiansen	8.62	[c] 2
Oct. 29[b]	....do	8.68	10
Nov. 24[a]	Stanley and Whipple	8.85	40

[a] Made by wading. [b] Made by wading 200 feet above gage. [c] Estimated.

NOTE.—Measurements made June 24, July 22, and Nov. 24 by engineers of Irrigation Investigations, Department of Agriculture.

Daily gage height, in feet, of Russian River at Geyserville, Cal., for 1911.

[R. E. Smith, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.4	12.7	10.2	9.95	9.78	9.10	9.36	8.78	8.30	8.10	8.58	8.88
2	9.4	12.7	10.2	9.9	9.78	9.50	9.36	8.76	8.25	8.10	8.60	8.88
3	9.35	11.8	10.7	9.9	9.75	9.55	9.36	8.75	8.05	8.15	8.60	8.88
4	9.35	11.5	11.0	10.0	9.70	9.55	9.35	8.76	7.88	8.12	8.62	8.80
5	9.3	11.0	14.5	11.0	9.70	9.55	9.35	8.70	7.80	8.12	8.62	8.90
6	9.35	11.0	15.8	10.5	9.70	9.55	9.35	8.70	7.60	8.10	8.65	8.90
7	9.25	10.8	14.7	10.3	9.69	9.40	9.35	8.69	7.50	8.10	8.65	8.92
8	9.25	10.65	13.5	10.3	9.68	9.40	9.35	8.69	7.38	8.20	8.65	8.95
9	9.3	10.55	12.3	10.35	9.68	9.40	9.34	8.68	7.20	8.50	8.68	8.98
10	9.35	10.75	11.85	10.3	9.68	9.40	9.34	8.66	7.00	8.50	8.68	8.98
11	9.55	13.0	11.3	10.25	9.65	9.40	9.33	8.65	.....	8.55	8.68	8.98
12	10.1	12.0	11.0	10.25	9.65	9.40	9.33	8.65	.....	8.55	8.70	8.98
13	10.6	12.85	10.8	10.2	9.65	9.39	9.30	8.65	.....	8.60	8.72	8.95
14	11.0	11.7	10.65	10.15	9.65	9.39	9.30	8.63	.....	8.70	8.72	8.95
15	11.05	11.2	10.55	10.1	9.65	9.39	9.28	8.60	.....	8.68	8.72	8.95
16	10.55	11.05	10.5	10.15	9.65	9.39	9.25	8.60	.....	8.55	8.78	8.95
17	10.4	10.8	10.4	10.05	9.70	9.39	9.25	8.60	.....	8.65	8.80	8.98
18	10.3	10.6	10.35	10.0	9.80	9.39	9.15	8.60	.....	8.65	8.80	8.98
19	10.9	10.6	10.2	10.0	9.80	9.39	9.10	8.55	.....	8.62	8.82	8.95
20	14.1	10.5	10.2	10.0	9.80	9.39	9.05	8.52	.....	8.62	8.82	8.95
21	11.4	10.45	10.2	9.95	9.80	9.38	9.00	8.52	.....	8.62	8.85	8.95
22	10.7	10.45	10.15	9.95	9.75	9.38	8.95	8.52	.....	8.60	8.88	8.95
23	10.55	10.4	10.15	9.95	9.75	9.38	8.93	8.50	.....	8.68	8.88	8.95
24	11.35	10.35	10.1	9.9	9.75	9.38	8.90	8.48	.....	8.58	8.88	8.98
25	11.35	10.3	10.1	9.9	9.70	9.38	8.88	8.48	.....	8.50	8.88	8.98
26	11.4	10.3	10.1	9.8	9.70	9.38	8.85	8.48	.....	8.50	8.88	8.98
27	13.25	10.2	10.05	9.9	9.70	9.38	8.83	8.45	.....	8.50	8.85	8.98
28	15.0	10.2	10.05	9.85	9.65	9.37	8.80	8.45	.....	8.52	8.88	9.00
29	13.0	.....	10.0	9.85	9.65	9.37	8.80	8.42	7.00	8.55	8.88	9.02
30	13.5	.....	9.95	9.8	9.65	9.36	8.80	8.42	8.10	8.55	8.88	9.02
31	12.5	.....	9.95	.....	9.50	.....	8.79	8.35	.....	8.52	.....	9.10

NOTE.—Aug. 29, Mr. Beckett (of the Irrigation Investigations, United States Department of Agriculture) found river dry at gage. There was about 1 second-foot flowing 300 feet above but this sank into the ground before reaching the gage. The water was standing in pools or bed dry Aug. 24 to about Oct. 8 and there was little or no flow past the gage.

EAST FORK OF RUSSIAN RIVER NEAR UKIAH, CAL.

Location.—At suspension footbridge in the Yokayo grant, about three-fourths of a mile above junction with Russian River and 3 miles northeast of Ukiah.

Records available.—August 19 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff in two sections on left bank, 40 feet below bridge.

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Diversions and storage.—Flow partly regulated by storage at Echo and Silver lakes. The Eldorado canal, which supplies water for irrigation and mining, carries about 60 second-feet during the irrigation season (June 15 to Sept. 30) and about 30 second-feet during the remainder of the year.

Accuracy.—Results are good.

Cooperation.—Record of daily discharge furnished by Duryea, Haehl & Gilman. of San Francisco, Cal.

Daily discharge, in second-feet, of South Fork of American River near Kyburz, Cal., for 1907.

Day.	Sept.	Oct.	Nov.	Dec..	Day.	Sept.	Oct.	Nov.	Dec.
1	85	a 43	48	20	16	40	a 19	42	.....
2	80	a 37	40	20	17	38	a 18	42	.....
3	a 86	30	35	20	18	32	18	42	.....
4	a 92	20	30	a 20	19	a 29	20	42	.....
5	98	20	28	a 20	20	a 26	35	42	.....
6	89	20	37	70	21	a 23	30	41	.....
7	82	20	46	88	22	20	40	41	.....
8	80	20	55	70	23	20	a 42	41	.....
9	75	a 25	53	50	24	16	45	38	.....
10	75	30	50	a 120	25	25	63	40	.....
11	a 71	20	50	a 90	26	50	52	38	.....
12	a 66	20	48	70	27	50	65	36	.....
13	62	20	47	80	28	a 50	78	32	.....
14	56	20	46	35	29	49	a 71	30	.....
15	55	a 20	45	.....	30	50	a 63	30	.....
					31	.....	a 55	.....	.....

a Estimated or interpolated by engineers of United States Geological Survey from record of discharge of American River at Fairoaks and of South Fork of American River at Kyburz.

Monthly discharge of South Fork of American River near Kyburz, Cal., for 1907.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
September	98	15	55.3	3,290
October	78	18	34.8	2,140
November	55	28	41.2	2,450
December 1-14	120	20	55.2	1,530

SOUTH FORK OF AMERICAN RIVER NEAR PLACERVILLE, CAL.

Location.—Below highway bridge at Chilli Bar, in the SE. ¼ sec. 26, T. 11 N., R. 10 E., about 1,000 feet below Big Canyon Creek, and 3 miles northwest of Placerville.

Records available.—August 11 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Three sections on right bank about 1,000 feet below bridge.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from downstream side of bridge, or by wading.

Diversions.—Just below the mouth of Silver Fork there is a diversion for irrigation, mining, and municipal supply for Placerville. Power is developed near the mouth of Rock Creek by the Western States Gas & Electric Co. Echo and Silver lakes are used as storage reservoirs.

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Discharge measurements of South Fork of American River near Placerville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 11[a]	F. C. Ebert	4.58	307
Sept. 24[b]	.....do	3.68	98

[a] Made from bridge. [b] Made by wading about 250 feet above gage.

Daily gage height, in feet, of South Fork of American River near Placerville, Cal., for 1911.

[Frank Baldschun, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.9	3.75	3.8	4.0	16	4.4	3.7	3.85	4.45	3.9
2	.....	3.9	3.8	3.8	4.0	17	4.35	3.7	3.85	4.3	4.1
3	.....	3.9	3.85	3.75	4.0	18	4.3	3.7	3.8	4.2	4.0
4	.....	3.85	3.85	3.75	4.0	19	4.2	3.7	3.75	4.1	3.9
5	.....	3.85	3.9	3.75	4.0	20	4.2	3.7	3.75	4.1	3.9
6	.....	3.85	3.9	3.75	4.0	21	4.5	3.65	3.75	4.1	3.9
7	.....	3.85	3.9	3.8	4.0	22	4.15	3.65	3.7	4.1	3.85
8	.....	3.85	3.85	3.85	4.0	23	4.05	3.7	3.7	4.05	3.85
9	.....	3.8	3.9	3.85	4.0	24	4.05	3.7	3.7	4.05	4.2
10	.....	3.8	4.0	4.6	4.0	25	4.05	3.7	3.75	4.05	3.9
11	4.6	3.8	3.95	4.75	3.95	26	4.0	3.8	3.75	4.05	3.9
12	4.55	3.8	3.95	4.2	3.95	27	4.15	3.8	3.85	4.0	3.9
13	4.5	3.75	3.9	4.2	3.95	28	4.0	3.7	3.9	4.0	4.25
14	4.45	3.75	3.9	4.15	3.95	29	3.95	3.65	3.85	4.0	4.2
15	4.4	3.7	3.85	4.1	3.95	30	3.95	3.75	3.8	4.0	4.2
						31	3.95	.....	3.8	.....	4.2

CACHE CREEK AT LOWER LAKE, CAL.

Location.—Above highway bridge near outlet of Clear Lake, in the SE. ¼ SE. ¼ sec. 34, T. 13 N., R. 7 W., just above Seigler Creek and 1 mile north of Lower Lake.

Records available.—January 1, 1901, to December 31, 1911.

Drainage area.—500 square miles.

Gage.—Vertical staff on left bank 400 feet above bridge. Previous to March 26, 1903, the gage was located at the bridge. The original datum has not been changed.

Channel.—Gravel and permanent.

Discharge measurements.—Made from car and cable 100 feet below gage.

Accuracy.—Results are good.

Discharge measurements of Cache Creek at Lower Lake, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 30	E. O. Christiansen	2.61	39
Dec. 2	S. C. Whipple	2.43	25

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Daily discharge, in second-feet, of South Fork of American Ri
1906–1907—Continued.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	S
1907.					1907.	
1	58	a 26	44	30	16	
2	58	a 25	40	20	17	
3	55	25	32	32	18	
4	a 56	23	32	a 31	19	
5	a 57	23	30	a 31	20	
6	58	23	a 28	30	21	
7	62	20	a 25	52	22	
8	60	20	23	38	23	
9	56	a 25	23	30	24	
10	55	30	20	a 80	25	
11	a 51	23	20	a 70	26	
12	a 46	23	20	a 60	27	
13	42	20	a 20	60	28	
14	40	20	a 20	30	29	
15	40	a 20	20	.....	30	
					31	

a Discharge estimated or interpolated by engineers of United States
discharge of American River at Fair oaks and South Fork of American

Monthly discharge of South Fork of American River at

Month.	Disch
	Maximu
1906.	
April 11–30	
May	1,
June	2,
July	2,
August	
1907.	
September	
October	
November	
December 1–14	

SOUTH FORK OF AMERICAN RIVER BELOW S

Location.—At the bridge just below the mout
intake of Eldorado canal and about half a m
Records available.—February 25, 1906, to Au
Drainage area.—Not measured.
Gage.—Vertical staff on right pier of bridge.
Channel.—Contains bowlders; rough.
Discharge measurements.—Made from b
Artificial control.—Flow partly regulated
Accuracy.—Results fair.
...eration.—Record of daily discharg
...Francisco.

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Daily discharge, in second-feet, of South Fork of American River near Kyburz, Cal., for 1911.

Day.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								

[illegible] Discharge estimated or interpolated by engineers of [illegible] discharge of American River at Fairoaks and South Fork [illegible]

Monthly discharge of South Fork of American [illegible] for [illegible]

Month.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
March							
April							
May							
June							
July							

SOUTH FORK OF [illegible]

Location.—About half a mile [illegible] Fork and 1 mile below Kyburz.

Records available.—August [illegible]

Drainage area.—Not [illegible]

Gage.—Recording; on left [illegible]

Discharge measurements [illegible]

Lake, Cal., for 1911.

s.]

Run-off.			Accuracy.
Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
0.086	0.10	2,640	A.
.784	.82	21,800	A.
2.32	2.68	71,300	A.
1.84	2.05	54,600	A.
1.28	1.48	39,300	A.
.876	.98	26,100	A.
.536	.62	16,500	A.
.292	.34	8,980	A.
.142	.16	4,240	A.
.091	.10	2,810	A.
.071	.08	2,100	A
.055	.06	1,700	A.
.696	9.47	252,000	

CAL.

of Yolo, in Río Jesús María land
ıd bridge at Yolo.
31, 1911.

rtical and fastened to pile under
ı right bank 30 feet above bridge.
ıwood tree on right bank 70 feet
ɔer end of right abutment. This
datum as the original gage at the

r by wading.
ation above the station.
se the results are good.

Yolo, Cal., in 1911.

	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
	2.03	256
	3.87	1,180
	5.45	1,890
	3.38	814
	1.84	150
	.40	0
		0

c Creek dry.

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Daily discharge, in second-feet, of Pilot Creek near Quintette, Cal., for 1910–11.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.											
1	.....	76	116	47	15	7	7	6	6	4	4
2	.....	76	132	47	15	7	7	4	6	4	4
3	.....	88	132	41	11	7	7	4	6	4	36
4	.....	101	150	47	11	7	7	4	6	4	28
5	.....	116	150	41	11	7	7	4	6	4	12
6	.....	116	150	41	11	7	7	4	6	4	8
7	.....	116	150	41	11	7	7	4	6	4	12
8	.....	116	132	35	11	7	7	4	6	4	8
9	.....	132	132	35	11	7	7	4	6	4	8
10	.....	132	132	35	11	7	7	4	6	4	8
11	.....	132	150	35	11	7	7	4	8	6	36
12	.....	132	132	35	11	7	7	4	12	8	16
13	.....	150	116	30	7	7	7	6	12	4	12
14	.....	150	116	30	7	7	7	6	8	4	8
15	.....	150	101	30	7	7	7	8	8	4	8
16	.....	132	101	30	7	7	7	36	8	4	6
17	.....	132	101	25	7	7	7	16	8	4	6
18	.....	170	101	25	7	7	7	12	12	6	6
19	.....	261	101	25	7	7	7	12	12	4	6
20	.....	343	88	25	7	7	7	12	12	4	6
21	.....	300	88	25	7	7	7	12	12	4	6
22	.....	278	76	25	7	7	7	12	12	4	6
23	.....	261	76	20	7	7	7	12	12	4	4
24	35	212	76	20	7	7	7	8	8	4	4
25	76	191	66	20	7	7	7	8	8	16	4
26	66	170	55	20	7	7	7	8	6	6	4
27	66	150	47	20	7	7	7	6	6	6	4
28	66	132	66	20	7	7	7	6	4	6	4
29	.....	116	55	20	7	7	7	6	4	4	4
30	.....	116	55	20	7	7	7	6	4	4	4
31	.....	101	.....	15	.....	7	7	.....	4	.....	4

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	4	370	44	244	144	84	22	6
2	6	268	44	268	144	84	22	6
3	6	220	44	268	144	84	22	6
4	8	200	72	244	144	72	22	6
5	4	160	72	584	180	72	12	6
6	4	144	84	506	160	72	12	6
7	4	112	112	402	144	72	12	6
8	4	112	160	316	144	72	12	6
9	8	96	144	316	128	62	12	6
10	22	84	144	292	128	62	12	6
11	12	84	128	268	128	44	12	6
12	62	72	128	220	128	44	12	6
13	96	72	112	200	128	44	12	6
14	200	72	112	180	112	44	12	6
15	72	62	112	180	112	36	8	6
16	84	52	112	160	112	36	8	6
17	72	52	112	160	96	36	8	6
18	28	52	112	180	112	36	8	6
19	22	52	112	200	96	36	8	6
20	112	52	128	200	96	28	8	6
21	128	52	128	200	96	28	8	6
22	72	52	144	200	112	28	8	6
23	62	44	144	220	112	28	8	6
24	244	44	160	220	96	28	8	6
25	316	44	160	244	96	28	8	6
26	180	44	160	220	84	28	8	6
27	128	44	160	200	84	22	8	6
28	112	44	180	180	84	22	8	6
29	200	.....	200	160	84	22	8	6
30	784	.....	200	160	96	22	8	6
31	744	.....	220	.....	96	.....	6	6

NOTE.—Discharge Dec. 31, 1910, interpolated by engineers of United States Geological Survey.

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Monthly discharge of Pilot Creek near Quintette, Cal., for 1910–11.

[Drainage area, 18.7 square miles.]

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
February 24–8	76	35	61.8	613
March	343	76	156	9,590
April	150	47	105	6,250
May	47	15	29.8	1,830
June	15	7	8.9	530
July	7	7	7.0	430
August	7	7	7.0	430
September	36	4	8.1	482
October	12	4	7.7	473
November	16	4	4.9	292
December	36	4	9.2	566
The period				21,500
1911.				
January	784	4	123	7,560
February	370	44	98.4	5,460
March	220	44	127	7,810
April	584	160	246	14,600
May	180	84	117	7,190
June	84	22	45.9	2,730
July	22	6	11.0	676
August	6	6	6.0	369
The period				46,400

PILOT CREEK DITCH NEAR QUINTETTE, CAL.

Location.—Just south of the gaging station on Pilot Creek.

Cooperation.—Record of daily discharge furnished by Stone & Webster Engineering Corporation.

The amount diverted by the ditch is added to the flow at the Bacchi road crossing to determine the total run-off from the drainage area of the creek above this point.

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Daily discharge, in second-feet, of Pilot Creek ditch near Quintette, Cal., for 1910–11.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.											
1	.....	11	11	13	11	9	8	11	14	5	7
2	.....	11	11	13	11	11	8	11	14	5	7
3	.....	11	11	13	14	11	8	11	14	4	14
4	.....	11	0	13	14	11	8	14	14	4	11
5	.....	11	0	13	14	11	9	14	14	4	11
6	.....	11	0	13	14	11	9	11	14	4	9
7	.....	11	0	13	14	9	9	14	14	4	9
8	.....	11	8	13	14	9	9	14	14	4	7
9	.....	13	6	11	14	9	9	14	14	7	7
10	.....	13	6	13	13	8	9	14	14	5	7
11	.....	13	8	11	13	8	9	14	17	5	14
12	.....	13	6	11	13	8	9	14	17	11	9
13	.....	13	6	13	13	8	9	14	14	7	9
14	.....	13	6	13	13	6	9	14	14	7	9
15	.....	13	5	13	13	6	9	17	14	5	9
16	.....	13	5	13	13	8	9	14	14	5	7
17	.....	13	5	13	13	8	9	11	14	5	7
18	.....	13	5	13	11	8	9	11	14	7	7
19	.....	13	5	13	11	8	9	9	14	7	7
20	.....	15	5	13	11	9	9	9	14	7	7
21	.....	13	5	13	11	9	9	9	14	5	7
22	.....	11	5	13	11	9	9	9	14	5	7
23	.....	11	5	13	11	9	9	9	14	7	7
24	.....	11	4	13	11	9	9	9	14	5	7
25	11	11	4	13	11	9	9	11	14	14	7
26	11	9	13	13	9	9	9	11	11	9	5
27	11	11	13	13	9	9	9	14	11	9	5
28	11	11	13	13	9	9	9	14	9	7	4
29	.....	11	13	13	9	9	9	14	7	7	5
30	.....	11	13	13	9	8	9	14	7	7	5
31	.....	11	.....	13	.....	8	9	.....	5	.....	4

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	4	.....	.....	.....	.....	0	7	9
2	5	.....	.....	.....	.....	0	7	9
3	4	.....	.....	.....	.....	0	7	9
4	3	.....	.....	.....	.....	0	7	9
5	5	.....	.....	.....	.....	0	11	9
6	5	.....	.....	.....	.....	0	11	9
7	5	.....	.....	.....	.....	0	11	9
8	5	.....	.....	.....	.....	0	11	9
9	11	.....	.....	.....	.....	0	11	9
10	11	.....	.....	.....	.....	0	11	9
11	9	.....	.....	.....	.....	9	14	9
12	14	.....	.....	.....	.....	9	14	9
13	0	.....	.....	.....	.....	9	11	9
14	0	.....	.....	.....	.....	9	11	9
15	0	.....	.....	.....	.....	9	14	9
16	0	.....	.....	.....	.....	9	11	9
17	0	.....	.....	.....	.....	9	11	9
18	0	.....	.....	.....	.....	9	11	9
19	0	.....	.....	.....	.....	7	11	7
20	0	.....	.....	.....	.....	7	11	7
21	0	.....	.....	.....	.....	7	11	7
22	0	.....	.....	.....	.....	7	11	7
23	0	.....	.....	.....	.....	7	11	7
24	0	.....	.....	.....	.....	7	11	7
25	0	.....	.....	.....	.....	7	11	7
26	0	.....	.....	.....	.....	7	11	7
27	0	.....	.....	.....	.....	7	11	7
28	0	.....	.....	.....	.....	7	9	7
29	0	.....	.....	.....	.....	7	9	7
30	0	.....	.....	.....	.....	7	9	7
31	0	.....	.....	.....	.....	.....	9	5

NOTE.—Ditch dry Jan. 13 to June 10, 1911.

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Monthly discharge of Pilot Creek ditch near Quintette, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1910.				
March	15	9	11.8	726
April	13	0	6.6	393
May	13	11	12.8	787
June	14	9	11.9	708
July	11	6	8.8	541
August	9	8	8.9	547
September	17	9	12.3	732
October	17	5	13.1	806
November	14	4	6.2	369
December	14	4	7.6	467
The period				6,080
1911.				
January	14	0	2.6	160
February	0	0	.0	0
March	0	0	.0	0
April	0	0	.0	0
May	0	0	.0	0
June	9	0	5.2	309
July	14	7	10.5	646
August	9	5	8.1	498
The period				1,610

SOUTH FORK OF AMERICAN RIVER AT KYBURZ, CAL.

Location.—At Nielson's ranch (Kyburz post office), in the NE. ¼ sec. 28, T. 11 N., R. 15 E., half a mile above junction with Silver Fork and half a mile below Slippery Ford.

Records available.—April 11, 1906, to September 1, 1906, and September 1, 1907, to December 14, 1907.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank.

Channel.—Sand and gravel; fairly smooth.

Discharge measurements.—Made from a car and cable at gage.

Artificial control.—Flow practically controlled by storage at Echo Lake.

Accuracy.—Results good.

Cooperation.—Record of daily discharge furnished by Duryea, Haehl & Gilman, of San Francisco, Cal.

Daily discharge, in second-feet, of South Fork of American River at Kyburz, Cal., for 1906–1907.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1906.							1906.						
1	.....	284	465	1,800	198	171	16	230	520	1,690	715	176	.....
2	.....	375	503	a1,530	202	.....	17	270	520	1,630	560	176	.....
3	.....	531	520	1,260	196	.....	18	260	606	1,670	512	176	.....
4	.....	560	920	2,360	189	.....	19	271	695	1,890	460	176	.....
5	.....	912	795	1,750	a 190	.....	20	250	695	1,660	445	176	.....
6	.....	795	670	970	190	.....	21	359	695	2,010	a 425	176	.....
7	.....	770	a 606	1,250	189	.....	22	500	645	1,740	a 405	174	.....
8	.....	795	542	986	183	.....	23	a 360	520	1,530	385	173	.....
9	.....	814	1,370	935	187	.....	24	285	560	1,750	389	173	.....
10	.....	907	1,330	868	186	.....	25	240	585	1,240	386	172	.....
11	199	1,040	1,800	823	182	.....	26	240	570	1,240	325	171	.....
12	190	670	1,750	935	181	.....	27	260	585	1,000	314	172	.....
13	191	625	1,270	729	180	.....	28	240	464	986	259	172	.....
14	195	740	1,550	832	179	.....	29	a 250	416	1,060	a 234	172	.....
15	a 230	645	1,130	628	178	.....	30	260	403	880	209	172	.....
							31	.....	425	.....	202	172	.....

a Discharge estimated or interpolated by engineers of the United States Geological Survey from record of discharge of American River at Fairoaks and South Fork of American River near Kyburz.

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Daily discharge, in second-feet, of South Fork of American River at Kyburz, Cal., for 1906–1907—Continued.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1907.					1907.				
1	58	a 26	44	30	16	39	a 20	20	
2	58	a 25	40	20	17	40	a 20	20	
3	55	25	32	32	18	38	20	20	
4	a 56	23	32	a 31	19	a 36	23	20	
5	a 57	23	30	a 31	20	a 33	35	20	
6	58	23	a 28	30	21	a 30	28	21	
7	62	20	a 25	52	22	28	40	21	
8	60	20	23	38	23	28	a 41	22	
9	56	a 25	23	30	24	28	42	20	
10	55	30	20	a 80	25	28	52	20	
11	a 51	23	20	a 70	26	28	44	20	
12	a 46	23	20	a 60	27	28	60	19	
13	42	20	a 20	60	28	a 28	72	19	
14	40	20	a 20	30	29	28	a 65	18	
15	40	a 20	20		30	26	a 58	19	
					31		a 51		

a Discharge estimated or interpolated by engineers of United States Geological Survey from records of discharge of American River at Fair oaks and South Fork of American River near Kyburz.

Monthly discharge of South Fork of American River at Kyburz, Cal., for 1906–7.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1906.				
April 11–30	500	190	264	10,500
May	1,040	284	625	38,400
June	2,010	465	1,240	73,800
July	2,360	202	770	47,300
August	202	171	180	11,100
1907.				
September	62	26	42.0	2,500
October	72	20	32.8	2,020
November	44	18	23.2	1,380
December 1–14	80	20	42.4	1,180

SOUTH FORK OF AMERICAN RIVER BELOW SILVER FORK, AT KYBURZ, CAL.

Location.—At the bridge just below the mouth of Silver Fork directly above the intake of Eldorado canal and about half a mile below Kyburz post office.

Records available.—February 25, 1906, to August 4, 1906.

Drainage area.—Not measured.

Gage.—Vertical staff on right pier of bridge.

Channel.—Contains bowlders; rough.

Discharge measurements.—Made from bridge.

Artificial control.—Flow partly regulated by storage at Echo and Silver lakes.

Accuracy.—Results fair.

Cooperation.—Record of daily discharge furnished by Duryea, Haehl & Gilman, of San Francisco.

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Daily discharge, in second-feet, of South Fork of American River below Silver Fork, at Kyburz, Cal., for 1906.

Day.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	.....	191	612	1,190	1,590	3,200	516
2	.....	a 208	478	1,300	1,380	a 2,720	470
3	.....	225	492	1,850	1,820	2,240	490
4	.....	a 206	390	1,750	2,500	2,940	459
5	.....	a 187	350	2,560	2,220	2,540	.....
6	.....	168	469	2,010	1,680	1,900	.....
7	.....	234	478	2,010	1,590	2,610	.....
8	.....	307	612	2,100	1,640	a 2,000	.....
9	.....	350	711	2,500	3,510	1,840	.....
10	.....	345	670	2,260	3,540	1,700	.....
11	.....	a 488	676	2,500	4,880	1,630	.....
12	.....	632	565	1,820	4,840	1,780	.....
13	.....	478	670	2,070	3,200	1,850	.....
14	.....	375	740	2,070	3,280	1,580	.....
15	.....	a 355	1,020	2,100	2,940	1,180	.....
16	.....	a 335	1,020	1,600	4,040	1,220	.....
17	.....	a 315	1,080	1,750	3,800	1,140	.....
18	.....	296	1,060	1,850	4,060	1,030	.....
19	.....	275	a 1,080	2,310	4,630	958	.....
20	.....	239	a 1,050	1,900	3,770	a 958	.....
21	.....	286	1,370	1,900	4,200	a 958	.....
22	.....	386	a 1,800	1,750	3,380	a 958	.....
23	.....	442	1,600	1,590	2,600	958	.....
24	.....	652	860	1,540	2,700	923	.....
25	267	670	728	1,820	2,710	882	.....
26	238	612	728	1,600	2,620	845	.....
27	.....	531	790	1,900	1,820	825	.....
28	239	442	670	1,360	1,640	667	.....
29	.....	472	a 730	1,280	1,690	a 623	.....
30	.....	478	790	1,280	1,750	579	.....
31	.....	750	.....	1,360	.....	534	.....

a Discharge estimated or interpolated by engineers of United States Geological Survey from records of discharge of American River at Fairoaks and South Fork of American River at Kyburz.

Monthly discharge of South Fork of American River below Silver Fork, at Kyburz, Cal., for 1906.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March	750	168	385	23,700
April	1,800	350	810	48,200
May	2,560	1,190	1,830	113,000
June	4,880	1,380	2,870	171,000
July	3,200	534	1,480	91,000

SOUTH FORK OF AMERICAN RIVER NEAR KYBURZ, CAL.

Location.—About half a mile below intake of Eldorado canal and mouth of Silver Fork and 1 mile below Kyburz post office.

Records available.—August 31, 1907, to December 14, 1907.

Drainage area.—Not measured.

Gage.—Recording; on left bank.

Discharge measurements.—Made from car and cable.

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Diversions and storage.—Flow partly regulated by storage at Echo and Silver lakes. The Eldorado canal, which supplies water for irrigation and mining, carries about 60 second-feet during the irrigation season (June 15 to Sept. 30) and about 30 second-feet during the remainder of the year.

Accuracy.—Results are good.

Cooperation.—Record of daily discharge furnished by Duryea, Haehl & Gilman. of San Francisco, Cal.

Daily discharge, in second-feet, of South Fork of American River near Kyburz, Cal., for 1907.

Day.	Sept.	Oct.	Nov.	Dec..	Day.	Sept.	Oct.	Nov.	Dec.
1	85	a 43	48	20	16	40	a 19	42	.....
2	80	a 37	40	20	17	38	a 18	42	.....
3	a 86	30	35	20	18	32	18	42	.....
4	a 92	20	30	a 20	19	a 29	20	42	.....
5	98	20	28	a 20	20	a 26	35	42	.....
6	89	20	37	70	21	a 23	30	41	.....
7	82	20	46	88	22	20	40	41	.....
8	80	20	55	70	23	20	a 42	41	.....
9	75	a 25	53	50	24	16	45	38	.....
10	75	30	50	a 120	25	25	63	40	.....
11	a 71	20	50	a 90	26	50	52	38	.....
12	a 66	20	48	70	27	50	65	36	.....
13	62	20	47	80	28	a 50	78	32	.....
14	56	20	46	35	29	49	a 71	30	.....
15	55	a 20	45	.....	30	50	a 63	30	.....
					31	.....	a 55	.....	.....

a Estimated or interpolated by engineers of United States Geological Survey from record of discharge of American River at Fairoaks and of South Fork of American River at Kyburz.

Monthly discharge of South Fork of American River near Kyburz, Cal., for 1907.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
September	98	15	55.3	3,290
October	78	18	34.8	2,140
November	55	28	41.2	2,450
December 1–14	120	20	55.2	1,530

SOUTH FORK OF AMERICAN RIVER NEAR PLACERVILLE, CAL.

Location.—Below highway bridge at Chilli Bar, in the SE. ¼ sec. 26, T. 11 N., R. 10 E., about 1,000 feet below Big Canyon Creek, and 3 miles northwest of Placerville.

Records available.—August 11 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Three sections on right bank about 1,000 feet below bridge.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from downstream side of bridge, or by wading.

Diversions.—Just below the mouth of Silver Fork there is a diversion for irrigation, mining, and municipal supply for Placerville. Power is developed near the mouth of Rock Creek by the Western States Gas & Electric Co. Echo and Silver lakes are used as storage reservoirs.

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Discharge measurements of South Fork of American River near Placerville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 11[a]	F. C. Ebert	4.58	307
Sept. 24[b]	do	3.68	98

[a] Made from bridge. [b] Made by wading about 250 feet above gage.

Daily gage height, in feet, of South Fork of American River near Placerville, Cal., for 1911.

[Frank Baldschun, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.9	3.75	3.8	4.0	16	4.4	3.7	3.85	4.45	3.9
2	.....	3.9	3.8	3.8	4.0	17	4.35	3.7	3.85	4.3	4.1
3	.....	3.9	3.85	3.75	4.0	18	4.3	3.7	3.8	4.2	4.0
4	.....	3.85	3.85	3.75	4.0	19	4.2	3.7	3.75	4.1	3.9
5	.....	3.85	3.9	3.75	4.0	20	4.2	3.7	3.75	4.1	3.9
6	.....	3.85	3.9	3.75	4.0	21	4.5	3.65	3.75	4.1	3.9
7	.....	3.85	3.9	3.8	4.0	22	4.15	3.65	3.7	4.1	3.85
8	.....	3.85	3.85	3.85	4.0	23	4.05	3.7	3.7	4.05	3.85
9	.....	3.8	3.9	3.85	4.0	24	4.05	3.7	3.7	4.05	4.2
10	.....	3.8	4.0	4.6	4.0	25	4.05	3.7	3.75	4.05	3.9
11	4.6	3.8	3.95	4.75	3.95	26	4.0	3.8	3.75	4.05	3.9
12	4.55	3.8	3.95	4.2	3.95	27	4.15	3.8	3.85	4.0	3.9
13	4.5	3.75	3.9	4.2	3.95	28	4.0	3.7	3.9	4.0	4.25
14	4.45	3.75	3.9	4.15	3.95	29	3.95	3.65	3.85	4.0	4.2
15	4.4	3.7	3.85	4.1	3.95	30	3.95	3.75	3.8	4.0	4.2
						31	3.95	.....	3.8	.....	4.2

CACHE CREEK AT LOWER LAKE, CAL.

Location.—Above highway bridge near outlet of Clear Lake, in the SE. ¼ SE. ¼ sec. 34, T. 13 N., R. 7 W., just above Seigler Creek and 1 mile north of Lower Lake.

Records available.—January 1, 1901, to December 31, 1911.

Drainage area.—500 square miles.

Gage.—Vertical staff on left bank 400 feet above bridge. Previous to March 26, 1903, the gage was located at the bridge. The original datum has not been changed.

Channel.—Gravel and permanent.

Discharge measurements.—Made from car and cable 100 feet below gage.

Accuracy.—Results are good.

Discharge measurements of Cache Creek at Lower Lake, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 30	E. O. Christiansen	2.61	39
Dec. 2	S. C. Whipple	2.43	25

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Daily gage height, in feet, of Cache Creek at Lower Lake, Cal., for 1911.

[J. R. Anderson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.85	3.85	4.65	6.8	5.8	5.0	4.25	3.7	3.1	2.75	2.60	2.50
2	1.9	4.1	4.65	6.8	5.8	5.0	4.25	3.65	3.1	2.75	2.60	2.45
3	1.85	4.1	5.55	6.75	5.75	4.95	4.25	3.65	3.1	2.8	2.60	2.45
4	1.85	4.15	5.1	6.6	5.75	4.9	4.2	3.6	3.1	2.7	2.60	2.45
5	1.85	4.2	5.65	6.75	5.75	4.9	4.2	3.6	3.05	2.7	2.58	2.40
6	1.85	4.25	7.4	6.75	5.75	4.9	4.15	3.55	3.0	2.7	2.58	2.55
7	1.9	4.25	7.8	6.7	5.75	4.85	4.15	3.55	3.0	2.7	2.65	2.55
8	1.9	4.25	7.9	6.6	5.7	4.85	4.15	3.5	3.0	2.65	2.60	2.50
9	2.1	4.3	7.65	6.6	5.6	4.8	4.1	3.5	2.95	2.75	2.55	2.50
10	1.8	4.3	7.8	6.6	5.55	4.8	4.1	3.5	2.9	2.7	2.80	2.50
11	2.0	4.4	7.8	6.75	5.5	4.75	4.1	3.45	2.9	2.65	2.55	2.45
12	1.95	4.45	7.75	6.5	5.6	4.75	4.05	3.45	2.9	2.65	2.52	2.45
13	2.05	4.7	7.75	6.4	5.5	4.75	4.0	3.4	2.85	2.7	2.50	2.45
14	2.05	4.6	7.8	6.35	5.45	4.7	4.0	3.4	2.9	2.7	2.52	2.45
15	2.1	4.65	7.85	6.35	5.5	4.7	4.0	3.35	2.9	2.65	2.60	2.45
16	2.15	4.65	7.75	6.3	5.4	4.7	4.0	3.4	2.85	2.65	2.55	2.50
17	2.15	4.75	7.65	6.3	5.35	4.65	4.0	3.35	2.85	2.65	2.55	2.50
18	2.15	4.7	7.6	6.3	5.4	4.65	3.95	3.35	2.85	2.65	2.55	2.50
19	2.3	4.7	7.5	6.2	5.3	4.65	3.9	3.3	2.8	2.65	2.55	2.52
20	2.5	4.7	7.45	6.15	5.25	4.6	3.9	3.3	2.8	2.65	2.52	2.48
21	2.55	4.7	7.4	6.1	5.25	4.55	3.9	3.25	2.8	2.6	2.52	2.45
22	2.55	4.7	7.35	6.05	5.2	4.55	3.85	3.25	2.8	2.65	2.52	2.45
23	2.55	4.75	7.35	6.05	5.25	4.5	3.8	3.2	2.8	2.65	2.52	2.45
24	2.6	4.75	7.4	6.0	5.25	4.5	3.8	3.2	2.75	2.65	2.50	2.45
25	2.7	4.8	7.25	5.95	5.2	4.45	3.8	3.2	2.75	2.7	2.50	2.42
26	2.7	4.7	7.15	6.0	5.1	4.4	3.75	3.15	2.75	2.6	2.52	2.40
27	3.25	4.65	7.1	5.95	5.1	4.4	3.75	3.15	2.75	2.6	2.52	2.52
28	3.45	4.6	7.0	5.9	5.05	4.4	3.75	3.15	2.75	2.6	2.55	2.48
29	3.6	.....	6.95	5.85	5.1	4.35	3.7	3.1	2.75	2.6	2.52	2.40
30	3.8	.....	6.9	5.85	5.1	4.3	3.7	3.1	2.85	2.6	2.50	2.45
31	3.8	.....	6.8	.....	5.0	.....	3.7	3.1	.....	2.62	.....	2.50

Daily discharge, in second-feet, of Cache Creek at Lower Lake, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4	240	432	1,060	750	520	332	208	99	54	39	30
2	5	296	432	1,060	750	520	332	198	99	54	39	26
3	4	296	675	1,050	735	506	332	198	99	60	39	26
4	4	308	547	999	735	494	320	188	99	49	39	26
5	4	320	705	1,050	735	494	320	188	92	49	37	22
6	4	332	1,260	1,050	735	494	308	178	85	49	37	34
7	5	332	1,390	1,030	735	482	308	178	85	49	44	34
8	5	332	1,430	999	720	482	308	169	85	44	39	30
9	9	344	1,340	999	690	469	296	169	78	54	34	30
10	3	344	1,390	999	675	469	296	169	72	49	60	30
11	7	369	1,390	1,050	660	456	296	160	72	44	34	26
12	6	382	1,380	967	690	456	284	160	72	44	32	26
13	8	444	1,380	935	660	456	273	150	66	49	30	26
14	8	419	1,390	919	646	444	273	150	72	49	32	26
15	9	432	1,410	919	660	444	273	141	72	44	39	26
16	10	432	1,380	903	631	444	273	150	66	44	34	30
17	10	456	1,340	903	617	432	273	141	66	44	34	30
18	10	444	1,320	903	631	432	262	141	66	44	34	30
19	16	444	1,290	872	603	432	251	132	60	44	34	32
20	30	444	1,270	858	589	419	251	132	60	44	32	28
21	34	444	1,260	841	589	406	251	124	60	39	32	26
22	34	444	1,240	826	575	406	240	124	60	44	32	26
23	34	456	1,240	826	589	395	229	115	60	44	32	26
24	39	456	1,260	810	589	394	229	115	54	44	30	26
25	49	469	1,210	795	575	382	229	115	54	49	30	24
26	49	444	1,180	810	547	369	218	107	54	39	32	22
27	124	432	1,160	795	547	369	218	107	54	39	32	32
28	160	419	1,130	780	534	369	218	107	54	39	34	28
29	188	.....	1,110	765	547	356	208	99	54	39	32	22
30	229	.....	1,100	765	547	344	208	99	66	39	30	26
31	229	.....	1,060	.....	520	.....	208	99	.....	41	.....	30

NOTE.—Daily discharge determined from a well-defined rating curve.

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Monthly discharge of Cache Creek at Lower Lake, Cal., for 1911.

[Drainage area, 500 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	229	3	42.9	0.086	0.10	2,640	A.
February	469	240	392	.784	.82	21,800	A.
March	1,430	432	1,160	2.32	2.68	71,300	A.
April	1,060	765	918	1.84	2.05	54,600	A.
May	750	520	639	1.28	1.48	39,300	A.
June	520	344	438	.876	.98	26,100	A.
July	332	208	268	.536	.62	16,500	A.
August	208	99	146	.292	.34	8,980	A.
September	99	54	71.2	.142	.16	4,240	A.
October	60	39	45.7	.091	.10	2,810	A.
November	60	30	35.3	.071	.08	2,100	A
December	34	22	27.6	.055	.06	1,700	A.
The year	1,410	3	348	.696	9.47	252,000	

CACHE CREEK AT YOLO, CAL.

Location.—At highway bridge one-half mile south of Yolo, in Río Jesús María land grant, 1,000 feet above Southern Pacific Railroad bridge at Yolo.

Records available.—January 1, 1903, to December 31, 1911.

Drainage area.—1,230 square miles.

Gage.—Staff in four sections. Lower section is vertical and fastened to pile under bridge. Second section, which is inclined, is on right bank 30 feet above bridge. Third section is vertical and fastened to cottonwood tree on right bank 70 feet above bridge. Upper section is bolted to upper end of right abutment. This gage was installed October 2, 1904, at the same datum as the original gage at the bridge.

Channel.—Sand and gravel and somewhat shifting.

Discharge measurements.—Made from bridge or by wading.

Diversions.—Numerous ditches take water for irrigation above the station.

Accuracy.—High-water estimates are fair. Otherwise the results are good.

Discharge measurements of Cache Creek at Yolo, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 16	J. E. Stewart	2.03	256
25	....do	3.87	1,180
Mar. 20	....do	5.45	1,890
May 8	....do	3.38	814
July 10[a]	....do	1.84	150
Oct. 11[b]	....do	.40	0
Dec. 5[c]	Ebert and Lee		0

[a] Made by wading about 300 feet above gage. [b] Water standing in pools. [c] Creek dry.

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Daily gage height, in feet, of Cache Creek at Yolo, Cal., for 1911.

[Cornelia W. Bigelow, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	.....	6.0	3.95	4.55	3.55	2.7	1.95	1.35	0.9	0.9
2	.....	5.5	4.4	4.5	3.5	2.65	1.95	1.35	.9	.9
3	.....	5.7	7.8	4.45	3.5	2.65	1.9	1.3	.9	.....
4	.....	5.0	9.95	4.4	3.5	2.6	1.9	1.3	.9	.....
5	.....	4.6	17.1	4.5	3.45	2.55	1.9	1.25	.....	.....
6	.....	4.4	17.5	5.4	3.45	2.55	1.9	1.25	.....	.....
7	.....	4.1	25.0	4.8	3.4	2.7	1.85	1.2	.....	.....
8	.....	3.9	16.6	4.55	3.4	2.65	1.8	1.2	.....	.....
9	.....	3.65	10.55	4.45	3.35	2.6	1.75	1.2	.....	.....
10	.....	3.5	8.9	4.4	3.3	2.55	1.75	1.2	.....	.....
11	.....	3.9	7.8	4.4	3.3	2.5	1.7	1.15	1.15	.....
12	.....	4.6	7.1	4.3	3.25	2.45	1.7	1.15	1.15	.....
13	.....	4.5	6.7	4.2	3.2	2.45	1.7	1.15	1.15	.....
14	2.15	4.4	6.35	4.15	3.1	2.4	1.7	1.1	1.1	.....
15	2.4	4.15	6.1	4.1	3.0	2.4	1.65	1.1	1.1	.....
16	2.1	3.95	6.0	4.1	2.95	2.35	1.65	1.1	1.1	.....
17	1.85	3.85	5.8	4.0	2.9	2.35	1.65	1.1	1.1	.....
18	1.6	3.75	5.7	3.95	2.9	2.3	1.65	1.05	1.1	.....
19	1.5	3.7	5.6	3.9	2.9	2.25	1.65	1.05	1.1	.....
20	4.9	3.65	5.5	3.85	2.85	2.25	1.6	1.05	1.1	.....
21	3.85	3.5	5.4	3.8	2.85	2.2	1.6	1.0	1.1	.....
22	2.7	3.45	5.2	3.75	2.85	2.2	1.6	1.0	1.1	.....
23	2.25	3.4	5.15	3.75	2.85	2.15	1.6	1.0	1.1	.....
24	2.2	3.35	5.1	3.7	2.85	2.1	1.6	1.0	1.05	.....
25	3.85	3.3	5.0	3.7	2.8	2.1	1.55	1.0	1.05	.....
26	3.4	3.3	4.9	3.7	2.8	2.05	1.55	.95	1.05	.....
27	3.3	3.25	4.8	3.65	2.8	2.0	1.5	.95	1.0	.....
28	10.4	3.2	4.75	3.65	2.8	2.0	1.45	.95	1.0	.....
29	12.45	.....	4.7	3.6	2.75	1.95	1.45	.95	.95	.....
30	8.35	.....	4.65	3.6	2.75	1.95	1.4	.9	.95	.....
31	9.15	.....	4.6	.....	2.7	.....	1.4	.9	.....	.....

NOTE.—All gage heights are considered reliable at this station, except from about May 12 to the first part of July. During this period the readings appear to have been partly estimated by the observer and partly read on a gage which was known to be 0.2 foot too high. These readings are all subject to an error of from 0.1 to 0.2 foot. Water standing in pools or creek dry Jan. 1–13, Sept. 5–10, and Oct. 3 to Dec. 31.

Daily discharge, in second-feet, of Cache Creek at Yolo, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	2,370	1,050	1,380	850	450	180	36	1	1	0	0
2	0	1,990	1,300	1,350	825	430	180	36	1	1	0	0
3	0	2,140	3,820	1,320	825	430	165	27	1	0	0	0
4	0	1,650	5,650	1,300	825	410	165	27	1	0	0	0
5	0	1,410	11,700	1,350	800	390	165	20	0	0	0	0
6	0	1,300	12,100	1,920	800	390	165	20	0	0	0	0
7	0	1,130	18,400	1,530	775	450	152	14	0	0	0	0
8	0	1,020	11,300	1,380	775	430	138	14	0	0	0	0
9	0	902	6,160	1,320	750	410	125	14.	0	0	0	0
10	0	835	4,760	1,300	725	390	125	14	0	0	0	0
11	0	1,020	3,820	1,300	725	370	112	10	10	0	0	0
12	0	1,410	3,250	1,240	700	350	112	10	10	0	0	0
13	0	1,350	2,930	1,180	675	350	112	10	10	0	0	0
14	288	1,300	2,650	1,160	630	330	112	7	7	0	0	0
15	375	1,160	2,450	1,130	585	330	100	7	7	0	0	0
16	270	1,050	2,370	1,130	562	312	100	7	7	0	0	0
17	190	1,000	2,220	1,080	540	312	100	7	7	0	0	0
18	120	950	2,140	1,050	540	295	100	5	7	0	0	0
19	95	925	2,060	1,020	540	278	100	5	7	0	0	0
20	1,590	902	1,990	1,000	518	278	88	5	7	0	0	0
21	1,000	835	1,920	975	518	260	88	3	7	0	0	0
22	490	812	1,780	950	518	260	88	3	7	0	0	0
23	322	790	1,750	950	518	242	88	3	7	0	0	0
24	305	768	1,720	925	518	225	88	3	5	0	0	0
25	1,000	745	1,650	925	495	225	77	3	5	0	0	0

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Daily discharge, in second-feet, of Cache Creek at Yolo, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26	790	745	1,590	925	495	210	77	2	5	0	0	0
27	745	722	1,530	902	495	195	66	2	3	0	0	0
28	6,030	700	1,500	902	495	195	56	2	3	0	0	0
29	7,770	.....	1,470	880	472	180	56	2	2	0	0	0
30	4,290	.....	1,440	880	472	180	45	1	2	0	0	0
31	4,970	.....	1,410	.....	450	.....	45	1	.....	0	.....	0

NOTE.—Daily discharge determined from two curves which are fairly well defined, except at high stages where theyare somewhat poorly defined and are applicable as follows: Jan. 1 to Apr. 30 and May 1 to Dec. 31, 1911. Discharge May 12 to about July 15 subject to 5 to 20 per cent error. The apparent rise June 7 is due to error of gage readings.

Monthly discharge of Cache Creek at Yolo, Cal., for 1911.

[Drainage area, 1,230 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	7,770	0	988	0.803	0.93	60,800	B.
February	2,370	700	1,140	.927	.97	63,300	B.
March	18,400	1,050	3,870	3.15	3.63	238,000	C.
April	1,920	880	1,160	.943	1.05	69,000	B.
May	850	450	626	.509	.59	38,500	C.
June	450	180	319	.259	.29	18,900	C.
July	180	45	109	.089	.10	6,700	C.
August	36	1	10.3	.0084	.01	633	D.
September	10	0	4.3	.0035	.004	256	D.
October	1	0	0.1	.0000	.000	4	
November	0	0	.0	.0000	.000	0	
December	0	0	.0	.0000	.000	0	
The year	18,400	0	685	.557	7.573	496,000	

PUTAH CREEK AT WINTERS, CAL.

Location.—Just below Southern Pacific Co.'s railroad bridge in Winters, in the Río de los Putos grant.

Records available.—September 26, 1905, to December 31, 1911.

Drainage area.—805 square miles.

Gage.—Staff in five sections on left bank, 600 feet below bridge. An auxiliary vertical staff on right bank is used for low water. The original gage datum has been maintained.

Channel.—Sand and gravel and somewhat shifting. Two channels at low water.

Discharge measurements.—Made from car and cable at gage and by wading.

Diversions.—With the exception of a small amount of water pumped for irrigation, there are no diversions above the station.

Accuracy.—Results are fair except for low water, which are only approximate. Beginning about May 17, 1911, a temporary dam was constructed across the creek 500 feet below the gages, ponding water for recreation purposes. This dam was partially destroyed October 2, 1911.

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Discharge measurements of Putah Creek at Winters, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Jan. 17	J. E. Stewart	5.79[a]	604
25	do	9.83[a]	3,690
Mar. 21	do	6.19[a]	848
May 8[b]	do	4.73[a]	212
31[d]	do	8.98[c]	95
July 10[d]	do	9.81[c]	21
Oct. 17[e]	do	4.57[c]	8.2

[a] North channel gage.
[b] Measurement by wading 400 feet below gage.
[c] South channel gage.
[d] Measurement by wading 500 feet below gage; affected by backwater from temporary dam.
[e] Measurement by wading 50 feet below gage.

Daily gage height, in feet, of Putah Creek at Winters, Cal., for 1911.

[Erna Wyatt, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.06	9.57	6.26	5.26	4.85	.....	.....	.....	.....	.....	4.58	4.67
2	4.06	8.88	6.32	5.23	4.84	.....	.....	.....	.....	.....	4.58	4.66
3	4.06	9.08	10.60	5.21	4.84	.....	.....	.....	.....	4.67	4.57	4.65
4	4.06	8.18	9.30	5.14	4.83	.....	.....	.....	.....	4.67	4.57	4.67
5	4.06	7.38	17.15	6.12	4.75	.....	.....	.....	.....	4.67	4.57	4.72
6	4.06	7.58	18.80	7.57	4.74	.....	.....	.....	.....	4.62	4.57	4.76
7	4.06	7.03	26.22	6.54	4.74	.....	.....	.....	.....	4.62	4.57	4.75
8	4.06	6.72	15.30	6.16	4.74	.....	.....	.....	.....	4.57	4.57	4.75
9	4.06	6.44	12.20	.....	4.74	.....	.....	.....	.....	4.77	4.62	4.75
10	4.07	6.25	9.20	6.44	4.75	.....	.....	.....	.....	4.57	4.67	4.72
11	4.13	9.88	9.00	6.09	4.84	.....	.....	.....	.....	4.57	4.67	4.72
12	4.24	7.98	8.27	5.89	4.79	.....	.....	.....	.....	4.57	4.77	4.72
13	7.78	9.38	7.67	5.74	4.76	.....	.....	.....	.....	4.52	4.82	4.72
14	10.58	7.98	7.38	5.59	4.76	.....	.....	.....	.....	4.52	4.82	4.72
15	9.38	7.28	7.13	5.52	4.74	.....	.....	.....	.....	4.47	4.77	4.72
16	6.44	6.74	6.99	5.44	4.74	.....	.....	.....	.....	4.47	4.66	4.72
17	5.79	6.54	6.76	5.37	.....	.....	.....	.....	.....	4.52	4.66	4.72
18	5.45	6.34	6.68	5.32	.....	.....	.....	.....	.....	4.52	4.66	4.72
19	5.35	6.22	6.44	.....	.....	.....	.....	.....	.....	4.47	4.57	4.72
20	15.20	6.07	6.29	5.15	.....	.....	.....	.....	.....	4.47	4.57	4.72
21	7.97	5.94	6.14	5.14	.....	.....	.....	.....	.....	4.47	.....	4.69
22	6.60	5.83	6.04	5.08	.....	.....	.....	.....	.....	4.47	4.67	4.69
23	6.04	5.76	5.94	5.04	.....	.....	.....	.....	.....	4.47	4.67	4.74
24	7.83	5.66	5.76	5.04	.....	.....	.....	.....	.....	4.57	4.67	4.74
25	9.38	5.62	5.72	4.99	.....	.....	.....	.....	.....	4.62	4.67	4.75
26	8.38	5.54	5.64	4.96	.....	.....	.....	.....	.....	4.62	4.67	4.75
27	8.38	5.49	5.56	4.94	.....	.....	.....	.....	.....	4.62	4.67	4.77
28	17.30	5.47	5.53	4.94	.....	.....	.....	.....	.....	4.62	4.67	4.77
29	15.30	.....	5.44	4.94	.....	.....	.....	.....	.....	4.62	4.67	4.77
30	12.48	.....	5.42	4.94	.....	.....	.....	.....	.....	4.62	4.67	4.77
31	13.30	.....	5.33	.....	.....	.....	.....	.....	.....	4.60	.....	4.87

NOTE.—Gage heights observed on North Channel gage Jan. 1 to May 22 (except Mar. 12 and 13, which were the same on both gages and June 19 to 24. Gage heights observed on south gage May 23 to June 18 and June 25 to Dec. 31. Gage heights about May 17 to Dec. 31 affected by back water from temporary dam constructed about 400 feet below the station to form a boating and swimming pool. The gage heights during most of the period May 17 to Oct. 2 were between 8 and 10 feet, and are omitted, since frequent changes in the dam render them useless as an index of the discharge. There was relatively little back water Oct. 3 to Dec. 31, and the relation of gage height to discharge was stable. Gage heights Mar. 5 to 7 determined from hydrograph.

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Daily discharge, in second-feet, of Putah Creek at Winters, Cal., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	28	3,590	889	389	245	.....	.....	.....	.....	20	9	17
2	28	2,950	928	377	242	.....	.....	.....	.....	20	9	16
3	28	3,130	4,600	369	242	.....	.....	.....	.....	17	8	15
4	28	2,340	3,340	344	239	.....	.....	.....	.....	17	8	17
5	28	1,690	12,500	807	218	.....	.....	.....	.....	17	8	22
6	28	1,840	15,000	1,830	215	.....	.....	.....	.....	12	8	27
7	28	1,420	28,300	1,070	215	.....	.....	.....	.....	12	8	26
8	28	1,200	9,960	831	215	.....	.....	.....	.....	8	8	26
9	28	1,010	6,280	920	215	.....	.....	.....	.....	28	12	26
10	29	882	3,240	1,010	218	.....	21	.....	.....	8	17	22
11	36	3,890	3,060	790	242	.....	.....	.....	.....	8	17	22
12	53	2,170	2,410	690	228	.....	.....	.....	.....	8	28	22
13	2,000	3,410	1,910	605	220	.....	.....	.....	.....	5	35	22
14	4,580	2,170	1,680	530	220	.....	.....	.....	.....	5	35	22
15	3,410	1,600	1,490	499	215	.....	.....	.....	.....	3	28	22
16	1,010	1,210	1,390	463	215	.....	.....	.....	.....	3	16	22
17	604	1,070	1,230	433	.....	.....	.....	.....	.....	5	16	22
18	432	941	1,170	413	.....	.....	.....	.....	.....	5	16	22
19	388	863	1,010	380	.....	.....	.....	.....	.....	3	8	22
20	9,330	767	908	348	.....	.....	.....	.....	.....	3	8	22
21	2,160	689	819	344	.....	.....	.....	.....	.....	3	12	19
22	1,120	676	762	323	.....	.....	.....	.....	.....	3	17	19
23	749	588	707	309	.....	.....	.....	.....	.....	3	17	25
24	2,040	535	615	309	.....	.....	.....	.....	.....	8	17	25
25	3,410	515	595	292	.....	.....	.....	.....	.....	12	17	26
26	2,510	475	555	281	.....	.....	.....	.....	.....	12	17	26
27	2,510	450	517	274	.....	.....	.....	.....	.....	12	17	28
28	12,800	442	504	274	.....	.....	.....	.....	.....	12	17	28
29	9,960	.....	463	274	.....	.....	.....	.....	.....	12	17	28
30	6,590	.....	454	274	.....	.....	.....	.....	.....	12	17	28
31	7,490	.....	417	.....	95	.....	.....	.....	.....	10	.....	41

NOTE.—Daily discharge based on three discharge rating curves applicable as follows; Jan. 1 to Mar. 20, fairly well defined; Mar. 21 to May 16, fairly well defined; Oct. 3 to Dec. 31, based on one measurement in 1911, and two in 1912, and not well defined. Discharge Oct. 1 and 2 estimated.

Monthly discharge of Putah Creek at Winters, Cal., for 1911.

[Drainage area, 805 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	12,800	28	2,390	2.97	3.42	147,000	C.
February	3,890	442	1,520	1.89	1.97	81,600	B.
March	28,300	417	3,470	4.31	4.97	213,000	C.
April	1,830	274	535	.665	.74	31,800	C.
May 1–16	245	215	225	.280	.17	7,140	C.
October	28	3	9.9	.012	.01	609	D.
November	35	8	15.6	.019	.02	898	D.
December	41	15	23.5	.029	.03	1,440	D.

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NORTHERN PACIFIC OCEAN DRAINAGE BASINS.

RUSSIAN RIVER BASIN.

RUSSIAN RIVER NEAR UKIAH, CAL.

Location.—At Bailey's bridge, in the Yokayo grant, just above junction with East Fork, 3 miles northeast of Ukiah.

Records available.—August 18 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Painted on left abutment of bridge.

Channel.—Sand and gravel; may shift slightly at high water.

Discharge measurements.—Made from bridge or by wading.

Discharge measurements of Russian River near Ukiah, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 18	E. O. Christiansen	3.12	0.5
Nov. 2	do	3.10	[a].2
Nov. 20[b]	Whipple and Stanley	3.25	.5

[a] Estimated. [b] Made by wading by engineers of Irrigation Investigations, Department of Agriculture.

Daily gage height, in feet, of Russian River near Ukiah, Cal., for 1911.

[W. F. Lawrance, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	3.10	2.95	3.14	3.16	16	.....	2.88	2.98	3.14	3.40
2	.....	3.10	3.00	3.10	3.20	17	.....	2.88	3.02	3.16	3.45
3	.....	3.11	2.96	3.10	3.30	18	.....	2.88	3.01	3.16	3.45
4	.....	3.12	2.96	3.10	3.30	19	3.11	2.88	3.04	3.16	3.40
5	.....	3.12	2.97	3.11	3.30	20	3.12	2.88	3.04	3.16	3.40
6	.....	3.11	2.96	3.11	3.32	21	3.05	2.88	3.04	3.20	3.38
7	.....	3.14	2.97	3.11	3.32	22	3.11	2.88	3.01	3.20	3.38
8	.....	3.14	2.96	3.11	3.35	23	3.14	2.88	3.04	3.20	3.38
9	.....	3.14	2.98	3.12	3.38	24	3.14	2.88	3.04	3.20	3.38
10	.....	3.12	2.98	3.14	3.38	25	3.14	2.88	3.04	3.20	3.38
11	.....	2.95	2.97	3.14	3.38	26	3.10	2.88	3.04	3.20	3.38
12	.....	2.95	2.97	3.14	3.38	27	3.10	2.88	3.04	3.18	3.51
13	.....	2.95	2.98	3.14	3.38	28	3.10	2.88	3.04	3.18	3.78
14	.....	2.88	2.98	3.14	3.38	29	3.10	2.88	3.04	3.18	3.70
15	.....	2.88	2.98	3.14	3.49	30	3.08	2.88	3.04	3.16	3.55
						31	3.10	.....	3.04	.....	3.75

RUSSIAN RIVER AT GEYSERVILLE, CAL.

Location.—At highway bridge, in the Tzabaco grant, half a mile northeast of Geyserville.

Records available.—December 5, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Painted on lower caisson of sixth pier from right end of bridge, with a vertical staff for low water.

Channel.—Gravel; smooth; section shifts slightly during high water. Overflow section on left bank.

Discharge measurements.—Made from upstream side of bridge and by wading.

Diversions.—Water is diverted from the South Eel to the East Fork of Russian River for use in power development at Potter Valley.

Estimates are withheld until additional measurements are available.

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Discharge measurements of Russian River at Geyserville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 4	J. E. Stewart	11.00	2,680
June 24[a]	E. A. Ingham	9.40	213
July 22[a]	do	8.95	52
Aug. 18	E. O. Christiansen	8.62	[c]2
Oct. 29[b]	do	8.63	10
Nov. 24[a]	Stanley and Whipple	8.85	40

[a] Made by wading. [b] Made by wading 200 feet above gage. [c] Estimated.

NOTE.—Measurements made June 24, July 22, and Nov. 24 by engineers of Irrigation Investigations, Department of Agriculture.

Daily gage height, in feet, of Russian River at Geyserville, Cal., for 1911.

[R. E. Smith, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	9.4	12.7	10.2	9.95	9.78	9.10	9.36	8.78	8.30	8.10	8.58	8.88
2	9.4	12.7	10.2	9.9	9.78	9.50	9.36	8.76	8.25	8.10	8.60	8.88
3	9.35	11.8	10.7	9.9	9.75	9.55	9.36	8.75	8.05	8.15	8.60	8.88
4	9.35	11.5	11.0	10.0	9.70	9.55	9.35	8.76	7.88	8.12	8.62	8.90
5	9.3	11.0	14.5	11.0	9.70	9.55	9.35	8.70	7.80	8.12	8.62	8.90
6	9.35	11.0	15.8	10.5	9.70	9.55	9.35	8.70	7.60	8.10	8.65	8.90
7	9.25	10.8	14.7	10.3	9.69	9.40	9.35	8.69	7.50	8.10	8.65	8.92
8	9.25	10.65	13.5	10.3	9.68	9.40	9.35	8.69	7.38	8.20	8.65	8.95
9	9.3	10.55	12.3	10.35	9.68	9.40	9.34	8.68	7.20	8.50	8.68	8.98
10	9.35	10.75	11.85	10.3	9.68	9.40	9.34	8.66	7.00	8.50	8.68	8.98
11	9.55	13.0	11.3	10.25	9.65	9.40	9.33	8.65	.....	8.55	8.68	8.98
12	10.1	12.0	11.0	10.25	9.65	9.40	9.33	8.65	.....	8.55	8.70	8.98
13	10.6	12.85	10.8	10.2	9.65	9.39	9.30	8.65	.....	8.60	8.72	8.95
14	11.0	11.7	10.65	10.15	9.65	9.39	9.30	8.63	.....	8.70	8.72	8.95
15	11.05	11.2	10.55	10.1	9.65	9.39	9.28	8.60	.....	8.68	8.72	8.95
16	10.55	11.05	10.5	10.15	9.65	9.39	9.25	8.60	.....	8.55	8.78	8.95
17	10.4	10.8	10.4	10.05	9.70	9.39	9.25	8.60	.....	8.65	8.80	8.98
18	10.3	10.6	10.35	10.0	9.80	9.39	9.15	8.60	.....	8.65	8.80	8.98
19	10.9	10.6	10.2	10.0	9.80	9.39	9.10	8.55	.....	8.62	8.82	8.95
20	14.1	10.5	10.2	10.0	9.80	9.39	9.05	8.52	.....	8.62	8.82	8.95
21	11.4	10.45	10.2	9.95	9.80	9.38	9.00	8.52	.....	8.62	8.85	8.95
22	10.7	10.45	10.15	9.95	9.75	9.38	8.95	8.52	.....	8.60	8.88	8.95
23	10.55	10.4	10.15	9.95	9.75	9.38	8.93	8.50	.....	8.68	8.88	8.95
24	11.35	10.35	10.1	9.9	9.75	9.38	8.90	8.48	.....	8.58	8.88	8.95
25	11.35	10.3	10.1	9.9	9.70	9.38	8.88	8.48	.....	8.50	8.88	8.98
26	11.4	10.3	10.1	9.8	9.70	9.38	8.85	8.48	.....	8.50	8.88	8.98
27	13.25	10.2	10.05	9.9	9.70	9.38	8.83	8.45	.....	8.50	8.85	8.98
28	15.0	10.2	10.0	9.85	9.65	9.37	8.80	8.45	.....	8.52	8.88	9.00
29	13.0	.....	10.0	9.85	9.65	9.37	8.80	8.42	7.00	8.55	8.88	9.02
30	13.5	.....	9.95	9.8	9.65	9.36	8.80	8.42	8.10	8.55	8.88	9.02
31	12.5	.....	9.95	.....	9.50	.....	8.79	8.35	.....	8.52	.....	9.10

NOTE.—Aug. 29, Mr. Beckett (of the Irrigation Investigations, United States Department of Agriculture) found river dry at gage. There was about 1 second-foot flowing 300 feet above but this sank into the ground before reaching the gage. The water was standing in pools or bed dry Aug. 24 to about Oct. 8 and there was little or no flow past the gage.

EAST FORK OF RUSSIAN RIVER NEAR UKIAH, CAL.

Location.—At suspension footbridge in the Yokayo grant, about three-fourths of a mile above junction with Russian River and 3 miles northeast of Ukiah.

Records available.—August 19 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff in two sections on left bank, 40 feet below bridge.

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Channel.—Sand and gravel; shifts during high stages.

Discharge measurements.—Made from footbridge above gage and by wading.

Diversions.—The Snow Mountain Water & Power Co. diverts water by a tunnel from the South Eel for use in power development at Potter Valley. This water enters the East Fork about 14 miles above the station. At low stages regulation at the power plant causes a noticeable fluctuation in the discharge. The daily load fluctuates greatly and hence the low-water gage heights are liable to considerable error.

Discharge measurements of East Fork of Russian River near Ukiah, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 19	E. O. Christiansen	4.80	[a]2.0
Nov. 1[b]	do	4.69	4.9
20[c]	Whipple and Stanley	5.04	22

[a] Estimated.
[b] Made by wading 200 feet below gage.
[c] Made by wading by engineers of Irrigation Investigations, United States Department of Agriculture.

Daily gage height, in feet, of East Fork of Russian River near Ukiah, Cal., for 1911.

[E. L. Rich, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	4.70	4.95	5.12	5.15	16	.....	5.08	4.80	5.02	5.35
2	.....	4.85	5.05	5.05	5.10	17	.....	4.90	5.00	4.95	5.38
3	.....	4.70	5.05	5.00	5.10	18	.....	4.95	5.08	4.99	5.41
4	.....	5.02	5.15	5.05	5.10	19	4.70	5.00	5.15	5.00	5.40
5	.....	4.95	5.20	5.10	5.10	20	4.90	4.95	5.15	5.00	5.42
6	.....	4.52	5.08	5.15	5.20	21	4.90	4.90	4.95	4.96	5.40
7	.....	5.00	5.15	5.15	5.20	23	5.30	4.75	4.95	4.95	5.35
8	.....	4.85	4.90	5.12	5.30	23	5.20	4.90	4.98	4.98	5.35
9	.....	4.85	4.90	5.05	5.30	24	4.90	5.00	4.85	5.00	5.40
10	.....	4.90	5.05	5.10	5.25	25	4.20	5.00	4.98	5.01	5.40
11	.....	5.25	5.05	5.15	5.25	26	4.78	4.85	5.10	4.95	5.40
12	.....	5.25	5.20	5.25	5.20	27	5.09	5.00	5.00	4.95	5.44
13	.....	5.10	4.90	5.12	5.25	28	4.90	4.90	5.00	5.00	5.45
14	.....	5.15	4.95	5.15	5.28	29	5.00	4.95	5.05	5.02	5.50
15	.....	4.99	4.85	5.00	5.32	30	4.70	5.10	5.00	5.00	5.50
						31	4.65	.....	5.10	.....	5.51

MATTOLE CREEK BASIN.

MATTOLE CREEK NEAR PETROLIA, CAL.

Location.—At highway bridge in the SW. ¼ sec. 11, T. 2 S., R. 2 W., Humboldt meridian, about 2 miles southeast of Petrolia.

Records available.—November 21 to December 31, 1911.

Drainage area.—264 square miles.

Gage.—Painted on left pier of highway bridge.

Channel.—Sand and gravel; will probably shift during high water.

Discharge measurements.—Made from bridge at gage and by wading.

The following discharge measurement was made by E. O. Christiansen, by wading 150 feet below gage:

November 21, 1911: Gage height, 5.70 feet; discharge, 114 second-feet.

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Daily gage height, in feet, of Mattole River near Petrolia, Cal., for 1911.

[Frank Adams, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1		5.38	11		5.88	21	5.70	6.04
2		5.35	12		5.79	22	5.65	5.94
3		5.35	13		5.74	23	5.60	6.04
4		5.35	14		5.69	24	5.54	6.02
5		5.54	15		5.64	25	5.50	5.48
6		7.32	16		5.61	26	5.49	5.89
7		6.88	17		5.75	27	5.44	7.20
8		6.39	18		5.54	28	5.42	7.98
9		6.12	19		5.28	29	5.40	7.36
10		5.98	20		6.15	30	5.40	7.09
						31		7.58

EEL RIVER BASIN.

SOUTH EEL RIVER AT HEARST, CAL.

Location.—At highway bridge at Hearst, in the NE. ¼ sec. 20, T. 19 N., R. 12 W., about 3 miles below Sanhedrin Creek. Salt Creek enters 300 feet below gage.

Records available.—December 8, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Painted on downstream caisson of left abutment of bridge with staff in two sections for lower stages.

Channel.—Gravel, with solid rock on left bank. Will shift slightly at high stages.

Discharge measurements.—Made from upstream side of bridge and by wading.

Diversions.—The Snow Mountain Water & Power Co. diverts water for use in power development about 10 miles above the station. This water is discharged into the East Fork of Russian River at Potter Valley.

Estimates are withheld until additional measurements have been made.

Discharge measurements of South Eel River at Hearst, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 3	J. E. Stewart	10.29	471
Aug. 19[a]	E. O. Christiansen	7.10	4.5
Nov. 4[b]	do	7.09	4.6
19[c]	Whipple and Stanley	7.26	8.7

[a] Made by wading 600 feet below gage. Salt Creek, which enters 300 feet below gage, was dry.
[b] Made by wading ¾ mile above gage.
[c] Made by wading by engineers of Irrigation Investigations, Department of Agriculture.

Daily gage height, in feet, of South Eel River at Hearst, Cal., for 1911.

[C. M. Neighbor, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.95	14.65	10.30	12.70	10.10	9.90	7.50	7.19	7.00	7.02	7.02	7.20
2	7.93	14.85	10.10	12.40	10.25	9.50	7.50	7.17	7.00	7.05	7.02	7.20
3	7.90	14.35	10.30	11.80	10.30	9.40	7.49	7.16	7.00	7.08	7.10	7.20
4	7.90	13.70	12.60	12.40	10.40	9.10	7.48	7.15	7.00	7.02	7.10	7.22
5	7.90	13.15	15.50	16.00	10.65	9.05	7.47	7.20	7.00	7.05	7.10	7.25
6	7.88	12.90	20.30	15.00	10.30	8.90	7.42	7.19	7.00	7.02	7.08	7.22
7	7.86	12.40	20.00	12.80	10.00	9.05	7.41	7.18	7.00	7.02	7.10	7.20
8	7.85	12.20	16.95	12.70	9.92	8.90	7.40	7.18	7.00	7.05	7.10	7.20
9	7.89	11.60	15.80	12.50	9.80	8.80	7.41	7.17	7.00	7.22	7.10	7.25
10	8.10	11.40	13.30	12.35	9.70	8.60	7.39	7.16	7.00	7.22	7.70	7.22

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Daily gage height, in feet, of South Eel River at Hearst, Cal., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11	10.65	13.90	13.20	12.20	9.70	8.52	7.43	7.15	7.00	7.18	7.30	7.25
12	10.22	13.20	12.70	12.10	9.70	8.46	7.35	7.16	7.00	7.12	7.20	7.25
13	10.42	13.70	12.40	11.80	9.65	8.37	7.33	7.16	7.02	7.10	7.20	7.25
14	11.30	12.90	12.30	11.50	9.65	8.10	7.30	7.15	7.02	7.10	7.25	7.25
15	11.06	12.30	12.20	11.40	9.35	8.05	7.31	7.14	7.02	7.10	7.40	7.25
16	10.15	11.90	12.10	11.50	9.40	7.94	7.31	7.12	7.00	7.10	7.25	7.32
17	9.65	11.50	12.30	11.20	9.45	7.87	7.30	7.10	7.00	7.08	7.22	7.50
18	10.40	11.30	12.30	11.10	11.45	7.70	7.30	7.10	7.00	7.08	7.18	7.45
19	18.65	11.80	12.20	11.00	10.70	7.68	7.29	7.11	7.00	7.08	7.18	7.38
20	18.20	11.51	12.35	10.90	10.20	7.65	7.29	7.12	7.00	7.08	7.22	7.35
21	13.70	11.11	12.40	10.80	10.10	7.62	7.29	7.12	7.00	7.08	7.22	7.35
22	12.10	11.10	12.50	10.80	10.10	7.64	7.28	7.15	7.00	7.08	7.22	7.40
23	11.38	11.00	12.30	10.85	10.05	7.62	7.28	7.12	7.00	7.10	7.22	7.38
24	13.52	10.80	12.20	11.40	9.90	7.61	7.26	7.10	7.00	7.05	7.22	7.30
25	13.15	10.80	12.00	11.10	9.50	7.61	7.25	7.10	7.02	7.08	7.22	7.28
26	13.50	10.60	11.90	11.00	9.50	7.60	7.24	7.08	7.02	7.05	7.20	7.30
27	15.80	10.45	11.50	10.80	9.40	7.60	7.23	7.05	7.05	7.02	7.20	7.30
28	16.85	10.45	11.80	10.60	9.30	7.58	7.22	7.05	7.10	7.05	7.20	7.40
29	14.95	.....	11.90	10.20	9.20	7.52	7.24	7.02	7.08	7.05	7.20	7.75
30	17.25	.....	12.50	10.10	9.30	7.50	7.20	7.02	.....	7.02	7.20	7.78
31	16.00	.....	12.60	.....	9.40	.....	7.18	7.02	.....	7.02	.....	7.75

NOTE.—Jan. 19, maximum recorded stage 23.6 feet at 5 p. m.

EEL RIVER NEAR LAYTONVILLE, CAL.

Location.—At highway bridge on Laytonville-Covelo road in the SW. ¼ sec. 31, T. 22 N., R. 13 W., about 500 feet below junction of South and Middle Eel rivers, and about 12 miles east of Laytonville. Burger Creek enters about 1 mile below the station.

Records available.—November 15 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff in three sections on right bank at bridge.

Channel.—Solid rock and coarse gravel; appears permanent.

Discharge measurements.—Made from car and cable three-fourths mile below gage and by wading.

Diversions.—The Snow Mountain Water & Power Co. diverts water from the South Eel above Hearst to the East Fork of Russian River for use in power development at Potter Valley.

The following discharge measurement was made by Christiansen and Whipple by wading 800 feet below gage:

November 15, 1911: Gage height, 7.85 feet; discharge, 101 second-feet.

Daily gage height, in feet, of Eel River at Laytonville, Cal., for 1911.

[R. S. Beard, observer.]

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1	.....	7.16	11	.....	7.41	21	7.52	7.72
2	.....	7.15	12	.....	7.40	22	7.50	7.55
3	.....	7.10	13	.....	7.41	23	7.49	7.50
4	.....	7.16	14	.....	7.36	24	7.44	7.62
5	.....	7.20	15	8.80	7.30	25	7.30	7.60
6	.....	7.40	16	9.10	7.40	26	7.30	7.50
7	.....	8.00	17	8.60	8.60	27	7.26	8.40
8	.....	8.00	18	8.25	8.40	28	7.21	9.80
9	.....	7.65	19	7.90	8.08	29	7.20	9.20
10	.....	7.52	20	7.62	7.88	30	7.20	8.95
						31	.....	8.85

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EEL RIVER AT SCOTIA, CAL.

Location.—At Wildwood Ferry, in sec. 18, T. 1 N., R. 1 E., Humboldt meridian, about one-half mile northeast of Scotia. Laribee Creek enters about 14 miles above and Van Duzen River 7 miles below the station.

Records available.—December 15, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff in four sections on left bank. The three lower sections are 70 feet above ferry, and upper section is at mouth of Dean Creek, 150 feet farther upstream.

Channel.—Solid rock and gravel; slightly shifting at high stages.

Discharge measurements.—Made from ferryboat and by wading.

Estimates are withheld until additional measurements are available.

Discharge measurements of Eel River at Scotia, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 28	E. O. Christiansen	9.90	128
Sept. 26	.....do	9.61	78
Nov. 28	.....do	9.98	201

NOTE.—Measurements made by wading about 1,000 feet below gage at ferry.

Daily gage height, in feet, of Eel River at Scotia, Cal., for 1911.

[Fred Daggett and Cecil Selvage, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.8	20.95	12.6	13.9	12.5	12.2	10.7	.....	.....	9.6	9.6	9.95
2	10.75	20.35	12.5	14.0	12.55	12.3	10.6	.....	.....	9.6	9.6	9.95
3	10.7	20.15	12.5	14.0	12.7	12 25	10.5	.....	.....	9.6	9.6	9.95
4	10.65	18.25	12.7	13.75	12.95	12.2	10.5	.....	.....	9.6	9.6	9.95
5	10.6	17.2	14.1	16.9	12.9	12.05	10.45	.....	.....	9.6	9.6	10.08
6	10.55	16.65	18.55	19.85	12.95	12.0	10.4	.....	.....	9.6	9.6	10.22
7	10.05	15.9	24.3	16.95	12.7	11.9	10.4	.....	.....	9.6	9.6	10.22
8	10.6	15.1	21.8	15.45	12.5	11.9	10.3	.....	.....	9.6	9.6	10.25
9	10.85	14.6	19.1	14.9	12.5	11.7	10.3	.....	.....	9.6	9.6	10.25
10	11.25	14.55	17.25	16.25	12.4	11.7	10.25	.....	.....	9.6	9.98	10.22
11	12.7	16.7	16.15	15.55	12.2	11.7	10.25	.....	.....	9.6	10.22	10.20
12	15.4	16.6	15.35	14.3	12.2	11.6	10.2	.....	.....	9.6	10.22	10.18
13	14.55	17.6	14.8	13.75	12.25	11.55	10.2	.....	.....	9.6	10.25	10.10
14	14.25	17.4	14.4	13.75	12.2	11.5	10.15	.....	.....	9.6	10.38	10 02
15	15.1	16.2	14.15	13.75	12.1	11.7	10.15	.....	.....	9.6	10.45	10.00
16	14.6	15.35	14.0	13.75	12.15	11.6	10.15	.....	.....	9.6	10.60	10.06
17	13.85	14.8	13.9	13.6	12.7	11.55	10.15	.....	.....	9.6	10.68	10.25
18	15.5	14.95	13.9	13.35	14.05	11.4	10.15	.....	.....	9.6	10.78	10.45
19	23.7	14.9	13.9	13.55	14.9	11.3	10.15	.....	.....	9.6	10.52	10.51
20	33.4	14.4	13.8	13.35	13.7	11.25	10.15	.....	.....	9.6	10.42	10.60
21	25.2	14.1	13.85	13.15	13.3	11.2	10.15	.....	.....	9.6	10.22	10.58
22	16.95	13.75	13.8	13.15	13.15	11.2	10.15	.....	.....	9.6	10.10	10.32
23	13.55	13.5	13.8	13.15	13.0	11.15	10.15	.....	.....	9.6	10.50	10.36
24	15.0	13.3	13.9	13.2	13.0	11.0	10.1	.....	9.6	9.6	10.25	10.34
25	16.2	13.2	13.8	13.3	12.75	10.9	10.0	.....	9.6	9.6	9.95	10.30
26	18.3	13.4	13.75	13.4	12.5	10.8	9.92	.....	9.6	9.6	9.95	10.25
27	18.7	12.9	13.5	13.2	12.35	10.8	9.9	.....	9.6	9.6	9.95	10.58
28	24.2	12.75	13.45	12.95	12.35	10.8	.....	9.9	9.6	9.6	9.95	11.60
29	22.15	.....	13.5	12.75	12.15	10.75	.....	.....	9.6	9.6	9.95	11.71
30	23.25	.....	13.5	12.55	12.1	10.7	.....	.....	9.6	9.6	9.95	11.55
31	25.0	.....	13.75	.....	12.1	.....	.....	.....	.....	9.6	.....	11.50

NOTE.—The observer's gage heights July 28 to Sept. 23 are known to be incorrect and are not published. The change in stage was gradual during this period.

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MIDDLE EEL RIVER NEAR COVELO, CAL.

Location.—Below highway bridge near Covelo ranger station, in E. ½ sec. 36, T. 23 N., R. 12 W., and about 7 miles east of Covelo. Williams Creek enters about half a mile above the station.

Records available.—August 22 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Inclined staff in two sections on left bank, about one-fourth of a mile west of ranger station and 1 mile below bridge.

Channel.—Small bowlders and gravel, and appears permanent.

Discharge measurements.—Made from downstream side of bridge above gage and by wading. The discharge of Williams Creek is added to give flow at gage.

Cooperation.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Middle Eel River near Covelo, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 22[a]	E. O. Christiansen	7.30	16
Nov. 7[a]	do	7.30	14
12[a]	S. C. Whipple	7.81	39

[a] Made by wading about 400 feet above gage below Williams Creek.

NOTE.—All gage heights are referred to datum of permanent gage installed Nov. 9, 1911. Measurement of Nov. 12 made by an engineer of Irrigation Investigations, Department of Agriculture.

Daily gage height, in feet, of Middle Eel River near Covelo, Cal., for 1911.

[C. V. Brereton, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	7.22	7.30	7.30	7.50	16	.....	7.25	7.32	8.85	7.72
2	.....	7.22	7.29	7.30	7.55	17	.....	7.24	7.30	8.30	7.88
3	.....	7.25	7.30	7.29	7.60	18	.....	7.21	7.30	8.15	7.65
4	.....	7.24	7.30	7.30	7.60	19	.....	7.20	7.28	8.02	7.70
5	.....	7.20	7.31	7.29	7.60	20	.....	7.18	7.28	8.05	7.70
6	.....	7.22	7.20	7.30	7.75	21	.....	7.18	7.28	7.95	7.70
7	.....	7.24	7.28	7.30	8.00	22	7.40	7.20	7.28	7.84	7.70
8	.....	7.22	7.31	.....	7.95	23	7.30	7.20	7.28	7.80	7.70
9	.....	7.22	7.32	7.35	7.85	24	7.22	7.19	7.28	7.74	7.72
10	.....	7.22	7.40	8.25	7.80	25	7.30	7.22	7.26	7.70	7.75
11	.....	7.25	7.40	8.08	7.80	26	7.25	7.22	7.30	7.70	7.78
12	.....	7.25	7.35	7.80	7.70	27	7.28	7.28	7.30	7.68	7.95
13	.....	7.25	7.38	7.72	7.70	28	7.24	7.28	7.30	7.65	8.00
14	.....	7.25	7.35	7.70	7.70	29	7.22	7.31	7.35	7.64	7.85
15	.....	7.25	7.34	8.15	7.65	30	7.21	7.30	7.35	7.60	7.85
						31	7.22	.....	7.31	.....	7.95

NOTE.—All gage heights refer to datum of permanent gage set Nov. 9, 1911.

SOUTH FORK OF EEL RIVER AT GARBERVILLE, CAL.

Location.—At highway bridge in the SW. ¼ sec. 24, T. 4 S., R. 3 E., Humboldt meridian, about 1 mile southwest of Garberville.

Records available.—August 25 to December 31, 1911.

Drainage area.—84 square miles.

Gage.—Chain gage on downstream side of bridge; length of chain 50.93 feet.

Channel.—Bowlders and gravel; will probably shift slightly during high water.

Discharge measurements.—Made from bridge at gage and by wading.

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Discharge measurements of South Fork of Eel River at Garberville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 25[a]	E. O. Christiansen	6.75	53
Nov. 18[a]	do	7.36	157

[a] Made by wading 300 feet below bridge.

Daily gage height, in feet, of South Fork of Eel River at Garberville, Cal., for 1911.

[W. L. Hurlbutt, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	6.7	6.7	6.7	6.80	16	.....	6.7	6.85	7.95	6.92
2	.....	6.7	6.75	6.7	6.78	17	.....	6.7	6.8	7.68	7.42
3	.....	6.7	6.8	6.7	6.78	18	.....	6.7	6.8	7.32	7.64
4	.....	6.7	6.8	6.7	6.80	19	.....	6.7	6.8	7.17	7.52
5	.....	6.7	6.8	6.7	6.86	20	.....	6.65	6.75	7.05	7.36
6	.....	6.7	6.78	6.7	7.25	21	.....	6.65	6.75	6.99	7.24
7	.....	6.7	6.75	6.7	7.47	22	.....	6.65	6.7	6.95	7.20
8	.....	6.7	6.78	6.7	7.42	23	.....	6.65	6.7	6.91	7.16
9	.....	6.7	6.9	6.78	7.18	24	.....	6.65	6.7	6.88	7.17
10	.....	6.7	6.88	7.48	7.06	25	6.75	6.65	6.7	6.88	7.14
11	.....	6.7	6.95	7.70	7.00	26	6.75	6.65	6.7	6.86	7.08
12	.....	6.7	6.9	7.25	6.96	27	6.75	6.7	6.7	6.86	7.68
13	.....	6.7	6.85	7.15	6.94	28	6.75	6.7	6.7	6.82	9.45
14	.....	6.7	6.88	7.18	6.90	29	6.75	6.7	6.7	6.80	8.69
15	.....	6.7	6.9	7.40	6.90	30	6.75	6.7	6.7	6.80	8.30
						31	6.72	.....	6.7	.....	8.46

VAN DUZEN RIVER AT BRIDGEVILLE, CAL.

Location.—Just below highway bridge at Bridgeville, in the NW. ¼ sec. 13, T. 1 N., R. 3 E., Humboldt meridian.

Records available.—September 22 to December 31, 1911.

Drainage area.—194 square miles.

Gage.—Staff in two sections on right bank just below bridge.

Channel.—Gravel; will probably shift during high water.

Discharge measurements.—Made from car and cable 90 feet below gage and by wading.

Discharge measurements of Van Duzen River at Bridgeville, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 22[a]	E. O. Christiansen	4.50	6.9
Oct. 19[b]	do	4.71	12

[a] Made by wading 300 feet above gage. [b] Made by wading 500 feet above gage.

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Daily gage height, in feet, of Van Duzen River at Bridgeville, Cal., for 1911.

[M. Lue Ballard, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1		4.59	4.64	4.90	16		4.78	6.50	5.50
2		4.60	4.65	4.90	17		4.77	6.05	5.60
3		4.62	4.66	4 89	18		4.74	5.62	5.56
4		4.66	4.65	4.88	19		4.70	5.48	5.62
5		4.66	4.63	5.12	20		4.69	5.32	5.65
6		4.64	4.65	5.46	21		4.65	5.25	5.55
7		4.61	4.67	5.80	22	4.51	4.65	5.16	5.62
8		4.62	4.72	5.47	23	4.51	4.65	5.05	5.68
9		4.81	5.12	5.36	24	4.51	4.66	5.04	5.72
10		4.88	5.65	5.24	25	4.51	4.68	5.01	5.62
11		4.81	5.61	5.18	26	4.53	4.69	4.96	5.60
12		4.79	5.61	5.06	27	4.59	4.67	4.91	6.40
13		4.75	5.46	4.92	28	4.59	4.65	4.91	6.20
14		4.82	5.48	5.05	29	4.59	4.65	4.90	6.00
15		4.88	6.30	5.25	30	4.59	4.66	4.90	5.95
					31		4.68		6.00

YAGER CREEK AT CARLOTTA, CAL.

Location.—At highway bridge at Carlotta, in sec. 28, T. 2 N., R. 1 E., Humboldt meridian, about half a mile above junction with Van Duzen River.

Records available.—August 29 to December 31, 1911.

Drainage area.—146 square miles.

Gage.—Vertical staff fastened to left abutment of bridge.

Channel.—Gravel and sand; may shift slightly at high stages.

Discharge measurements.—Made from railroad bridge 40 feet below gage and by wading.

Discharge measurements of Yager Creek at Carlotta, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 29	E. O. Christiansen	5.57	[a] 0.5
Sept. 23	do	5.55	[a] .2
Oct. 20[b]	do	5.61	1.2

[a] Estimated. [b] Made by wading 350 feet below gage.

Daily gage height, in feet, of Yager Creek at Carlotta, Cal., for 1911.

[Fred. E. Scribner and H. V. Bianchi, observers.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1		5.55	5.6	5.6	5.6	16		5.55	5.6	7.0	5.6
2		5.55	5.6	5.6	5.6	17		5.55	5.6	6.5	6.5
3		5.55	5.6	5.6	5.6	18		5.55	5.6	6.2	6.5
4		5.55	5.6	5.6	5.6	19		5.55	5.6	5.9	6.3
5		5.55	5.6	5.6	5.6	20		5.55	5.6	5.8	6.7
6		5.55	5.6	5.6	5.7	21		5.55	5.6	5.7	6.3
7		5.55	5.6	5.6	6.15	22		5.55	5.6	5.6	6.25
8		5.55	5.6	5.6	5.9	23		5.56	5.6	5.6	6.35
9		5.55	5.6	5.6	5.65	24		5.58	5.6	5.6	6.75
10		5.55	5.6	5.8	5.6	25		5.58	5.6	5.6	6.45
11		5.55	5.6	6.4	5.6	26		5.60	5.6	5.6	6.4
12		5.55	5.6	5.95	5.6	27		5.60	5.6	5.6	7.0
13		5.55	5.6	5.65	5.6	28		5.60	5.6	5.6	7.75
14		5.55	5.6	6.05	5.6	29	5.56	5.60	5.6	5.6	7.0
15		5.55	5.6	6.0	5.6	30	5.55	5.60	5.6	5.6	6.8
						31	5.55		5.6		7.5

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MAD RIVER BASIN.

MAD RIVER NEAR ARCATA, CAL.

Location.—At the Oregon & Eureka Railroad bridge at Essex, in sec. 15, T. 6 N., R. 1 E., Humboldt meridian, 1 mile below Warren Creek, and about 5 miles northeast of Arcata.

Records available.—December 29, 1910, to December 31, 1911.

Drainage area.—452 square miles.

Gage.—Vertical staff in two sections on right bank at railroad bridge.

Channel.—Sand and gravel; slightly shifting at high stages.

Discharge measurements.—Made from highway bridge just above gage and by wading.

Estimates are withheld until additional measurements are available.

Discharge measurements of Mad River near Arcata, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug 30[a]	E. O. Christiansen	11.84	29
Sept. 25[b]	do	11.79	21

[a] Made by wading 500 feet above gage. [b] Made by wading above bridge.

Daily gage height, in feet, of Mad River near Arcata, Cal., for 1911.

[Ernest McCloskey, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	12.9	17.9	13.9	14.6	13.4	13.3	12.35	11.95	11.85	11.8	11.80	12.00
2	12.8	17.8	13.95	14.6	13.5	13.3	12.3	11.95	11.85	11.8	11.80	12.08
3	12.7	18.0	13.85	14.1	13.55	13.2	12.3	11.9	11.85	11.8	11.80	12.08
4	12.7	17.1	14.2	14.1	13.45	13.15	12.3	11.9	11.85	11.8	11.80	12.08
5	12.65	16.1	14.4	19.0	14.15	13.05	12.3	11.9	11.8	11.8	11.80	12.05
6	12.6	16.6	15.25	17.1	13.8	13.0	12.25	11.9	11.8	11.8	11.80	12.05
7	12.55	16.15	17.55	15.95	13.9	13.0	12.2	11.9	11.8	11.82	11.80	12.30
8	12.55	15.5	17.3	15.5	14.0	12.95	12.2	11.9	11.8	11.85	11.82	12.25
9	13.2	15.25	16.2	15.6	14.4	12.95	12.2	11.9	11.8	11.85	11.85	12.20
10	14.6	15.1	15.95	16.2	14.1	12.9	12.2	11.9	11.8	11.85	12.40	12.18
11	17.2	16.55	15.5	16.75	13.95	12.8	12.15	11.9	11.8	11.85	12.40	12.15
12	15.35	16.35	15.3	16.2	13.75	12.7	12.15	11.9	11.8	11.85	12.25	12.10
13	15.15	16.3	15.15	15.7	13.6	12.7	12.1	11.9	11.8	11.85	12.18	12.08
14	14.75	15.85	15.05	15.45	13.5	12.7	12.1	11.9	11.8	11.88	12.10	12.08
15	14.65	15.55	15.0	15.1	13.45	12.65	12.05	11.9	11.8	11.85	13.12	12.05
16	14.5	15.1	15.0	15.0	13.7	12.6	12.05	11.9	11.8	11.85	13.55	12.10
17	14.45	15.05	15.05	14.9	14.6	12.6	12.05	11.85	11.8	11.85	13.00	12.74
18	14.55	15.85	15.1	14.7	18.1	12.6	12.05	11.85	11.8	11.85	12.70	12.75
19	22.0	15.5	15.1	14.5	16.4	12.55	12.0	11.85	11.8	11.85	12.35	12.60
20	20.8	15.3	15.1	14.3	15.55	12.55	12.0	11.85	11.8	11.85	12.30	12.58
21	18.0	15.0	15.15	14.15	15.1	12.5	12.0	11.85	11.8	11.85	12.20	12.55
22	16.5	14.8	15.05	14.1	14.7	12.5	12.0	11.85	11.8	11.85	12.20	12.48
23	15.85	14.6	15.25	14.0	14.6	12.5	12.0	11.85	11.8	11.82	12.18	12.50
24	15.7	14.5	15.15	13.9	14.2	12.45	12.0	11.85	11.8	11.82	12.10	12.52
25	16.0	14.45	14.9	13.85	13.95	12.45	12.0	11.85	11.8	11.82	12.08	12.58
26	16.8	14.2	14.7	13.8	13.8	12.4	12.0	11.85	11.8	11.82	12.02	12.60
27	16.75	14.2	14.5	13.75	13.65	12.4	12.0	11.85	11.8	11.82	12.00	13.29
28	16.6	14.05	14.2	13.6	13.5	12.4	11.95	11.85	11.8	11.82	12.00	14.60
29	16.3	.....	14.25	13.5	13.45	12.4	11.95	11.85	11.8	11.82	12.00	13.60
30	19.75	.....	14.7	13.45	13.4	12.35	11.95	11.85	11.8	11.82	12.00	13.40
31	19.3	.....	14.65	.....	13.3	.....	11.95	11.85	.....	11.82	.....	14.05

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REDWOOD CREEK BASIN.

REDWOOD CREEK NEAR KORBEL, CAL.

Location.—At highway bridge at Bair's ranch, in the SE. ¼ sec. 28, T. 7 N., R. 3 E., Humboldt meridian, 200 feet above Minor Creek and about 9 miles northeast of Korbel.

Records available.—September 4 to December 31, 1911.

Drainage area.—81 square miles.

Gage.—Temporary staff gage located just above mouth of Minor Creek used September 4 to October 14, when permanent chain gage was installed on downstream side of bridge to same datum as staff gage. Length of chain, 35.10 feet.

Channel.—Sand and gravel; will probably shift slightly at high stages.

Discharge measurements.—Made from bridge at gage and by wading.

Discharge measurements of Redwood Creek near Korbel, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 4	E. O. Christiansen	5.25	*a*2
Oct. 14[b]	do	5.75	14
Dec. 28[c]	do	6.88	151

[a] Estimated. [b] Made by wading 100 feet above gage. [c] Made by wading 20 feet below gage.

Daily gage height, in feet, of Redwood Creek near Korbel, Cal., for 1911.

[John Johnson, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	5.32	5.30	5.65	16	5.30	5.48	6.80	5.94
2	.....	5.36	5.30	5.65	17	5.30	5.45	6.40	6.44
3	.....	5.50	5.30	5.65	18	5.30	5.41	6.12	6.12
4	5.28	5.70	5.30	5.65	19	5.30	5.42	6.00	6.08
5	5.31	5.62	5.32	5.68	20	5.29	5.42	5.90	6.15
6	5.32	5.54	5.34	5.80	21	5.25	5.45	5.86	6.01
7	5.35	5.50	5.35	6.00	22	5.25	5.55	5.80	5.95
8	5.34	5.60	5.48	5.88	23	5.25	5.45	5.76	6.20
9	5.32	5.84	5.95	5.80	24	5.25	5.45	5.75	6.22
10	5.30	5.49	6.35	5.76	25	5.30	5.42	5.70	6.16
11	5.30	5.40	5.65	5.75	26	5.35	5.42	5.70	6.10
12	5.30	5.38	5.52	5.70	27	5.35	5.30	5.70	7.02
13	5.30	5.48	6.20	5.70	28	5.35	5.30	5.70	6.88
14	5.30	5.65	6.00	5.68	29	5.35	5.30	5.68	5.50
15	5.30	5.61	7.30	5.72	30	5.32	5.30	5.65	6.38
					31	.....	5.30	.....	6.82

NOTE.—Possibly slight error in gage heights Sept. 4 to Oct. 14 due to slope of water surface between the two gage sites (see description).

REDWOOD CREEK AT ORICK, CAL.

Location.—At highway bridge at Orick, in the NE. ¼ sec. 4, T. 10 N., R. 1 E., Humboldt meridian, about 1½ miles above mouth.

Records available.—September 10 to December 31, 1911.

Drainage area.—262 square miles.

Gage.—Chain gage on upstream side of bridge near left bank. Length of chain, 33.01 feet.

Channel.—Gravel and sand; may shift slightly at high stages.

Discharge measurements.—Made from highway bridge and by wading.

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Discharge measurements of Redwood Creek at Orick, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 10[a]	E. O. Christiansen	5.21	19
Dec. 17[b]	do	6.75	432

[a] Made by wading at gage. [b] Made by wading 150 feet below gage.

Daily gage height, in feet, of Redwood Creek at Orick, Cal., for 1911.

[R. F. Gruber, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	5.16	5.15	5.28	16	5.18	5.49	6.62	5.80
2	.....	5.15	5.14	5.22	17	5.16	5.46	6.35	6.02
3	.....	5.14	5.12	5.20	18	5.15	5.44	6.00	6.05
4	.....	5.12	5.12	5.28	19	5.14	5.41	5.60	5.70
5	.....	5.19	5.12	5.45	20	5.12	5.36	5.25	5.50
6	.....	5.28	5.16	5.52	21	5.11	5.28	5.45	5.38
7	.....	5.35	5.22	5.48	22	5.10	5.22	5.65	5.30
8	.....	5.40	5.32	5.38	23	5.10	5.22	5.62	5.30
9	.....	5.42	5.75	5.32	24	5.10	5.20	5.50	5.45
10	5.20	5.45	6.52	5.25	25	5.14	5.18	5.80	5.55
11	5.20	5.45	6.48	5.20	26	5.20	5.18	5.52	5.85
12	5.20	5.48	6.40	5.20	27	5.20	5.18	5.50	6.55
13	5.20	5.48	6.35	5.35	28	5.20	5.16	5.48	7.35
14	5.20	5.50	6.45	5.52	29	5.19	5.15	5.39	7.55
15	5.20	5.50	6.58	5.61	30	5.18	5.15	5.32	7.75
					31	.....	5.15	.....	8.10

KLAMATH RIVER BASIN.

SPRAGUE RIVER AT CHILOQUIN, OREG.

Location.—In sec. 3, T. 35 S., R. 7 E., at the Southern Pacific Railroad bridge at Chiloquin, 200 feet above the junction of Sprague and Williamson rivers.

Records available.—July 25, 1911, to December 31, 1911.

Gage.—Chain gage on railroad bridge.

Channel.—Rocky and probably permanent in main channel. The overflow channel is piled up with gravel and may shift in floods.

Accuracy.—Conditions are fair and good results should be obtained.

Diversions.—Above the forks of Sprague River there is a considerable amount of diversion for irrigation. At present there are no diversions below the forks, but a canal is being built to divert water a short distance above this station.

Cooperation.—This station is maintained by the United States Reclamation Service and the records are worked up and published by the Survey.

Discharge measurements of Sprague River at Chiloquin, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 25	L. Moser	1.00	513
Aug 28	R. W. Davenport	.98	428
Nov. 21	W. O. Harmon	1.22	424

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Daily gage height, in feet, of Sprague River at Chiloquin, Oreg., for 1911.

[Alfred Gentry, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	1.0	1.0	1.1	1.1	1.2	16	1.0	1.0	1.1	1.2	1.2
2	1.0	1.0	1.1	1.1	1.2	17	1.0	1.0	1.1	1.2	1.2
3	1.0	1.0	1.1	1.1	1.2	18	1.0	1.0	1.1	1.2	1.2
4	1.0	1.0	1.1	1.1	1.2	19	1.0	1.0	1.1	1.2	1.2
5	1.0	1.0	1.1	1.1	1.2	20	1.0	1.0	1.1	1.2	1.2
6	1.0	1.0	1.1	1.1	1.2	21	1.0	1.0	1.1	1.2	1.2
7	1.0	1.0	1.1	1.1	1.2	22	1.0	1.0	1.1	1.2	1.2
8	1.0	1.0	1.1	1.1	1.2	23	1.0	1.0	1.1	1.2	1.2
9	1.0	1.0	1.1	1.1	1.2	24	1.0	1.0	1.1	1.2	1.2
10	1.0	1.0	1.1	1.1	1.2	25	1.0	1.0	1.1	1.2	1.2
11	1.0	1.0	1.1	1.2	1.2	26	1.0	1.0	1.1	1.2	1.2
12	1.0	1.0	1.1	1.2	1.2	27	1.0	1.0	1.1	1.2	1.1
13	1.0	1.0	1.1	1.2	1.2	28	1.0	1.1	1.1	1.2	1.1
14	1.0	1.0	1.1	1.2	1.2	29	1.0	1.1	1.1	1.2	1.1
15	1.0	1.0	1.1	1.2	1.2	30	1.0	1.1	1.1	1.2	1.1
						31	1.0	.....	1.1	.....	1.1

UPPER KLAMATH LAKE NEAR KLAMATH FALLS, OREG.

Location.—In sec. 30, T. 38 S., R. 9 E., near Klamath Falls, Oreg.

Records available.—May 28, 1904, to December 31, 1911.

Drainage area.—3,110 square miles, at the outlet of lake.

Gage.—Friez automatic, installed February 16, 1906; referred to level of a staff gage installed May 28, 1904. Elevation of zero of staff gage 4,136.13 feet above sea level. Gage heights since February 16, 1906, are the means of the daily records obtained from the automatic gage.

Diversions.—Water is diverted from the lake to the main canal of the Klamath project of the United States Reclamation Service.

Fluctuations of lake level.—The level of the water surface of Klamath Lake is strongly affected by wind. When the wind blows from the south the water may be lowered as much as 6 inches near the outlet; when the wind is from the north the water surface may be raised 6 inches above its normal level; differences of a foot may be noticed within a few hours. If the effect of wind were eliminated, the record of lake heights would show much more gradual changes than are indicated by the following tables.

Cooperation.—Station maintained by the United States Reclamation Service since May, 1909.

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Daily gage height, in feet, of Upper Klamath Lake near Klamath Falls, Oreg., for 1911.

[Jas. Newnham and Graham Kiehl, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.60	5.50	5.58	6.28	6.53	5.97	5.40	5.07	4.87	4.49	4.63	4.84
2	5.60	5.50	5.57	6.30	6.56	6.00	5.31	5.04	4.88	4.53	4.63	4.84
3	5.60	5.50	5.56	6.30	6.50	6.00	5.34	5.02	4.88	4.48	4.63	4.85
4	5.60	5.50	5.55	6.26	6.28	6.02	5.37	5.01	4.86	4.48	4.69	4.85
5	5.60	5150	5.54	6.23	6.57	5.95	5.33	5.02	4.82	.....	.....	4.83
6	5.60	5.50	5.54	6.42	6.52	5.93	3.35	5.01	4.70	.....	.....	4.95
7	5.60	5.53	5.48	6.44	6.50	5.85	5.38	5.01	4.67	[a] 4.45	.....	5.02
8	5.53	5.53	5.49	6.56	6.40	5.90	5.41	5.01	4.62	4.33	.....	4.98
9	5.51	5.53	5.49	6.35	.....	5.85	5.27	5.08	4.63	4.47	.....	4.98
10	5.51	5.53	5.50	6.40	.....	5.83	5.30	5.00	4.60	4.53	.....	4.98
11	5.52	5.54	5.50	6.45	.....	5.80	5.28	5.01	4.61	4.52	[a] 4.75	4.96
12	5.55	5.54	5.51	6.55	.....	5.82	5.23	5.00	6.64	4.50	.....	4.96
13	5.52	5.55	5.51	6.55	.....	5.88	5.23	5.00	4.83	4.37	.....	4.93
14	5.52	5.56	5.52	6.50	6.55	5.87	5.20	5.00	4.87	4.51	.....	4.90
15	5.52	5.56	5.52	6.55	6.45	5.86	5918	4.99	4.91	4.62	.....	4.89
16	5.52	5.57	5.53	.....	6.40	5.84	5.15	5.00	4.97	4.60	.....	4.86
17	5.51	5.57	5.55	.....	6.38	5.82	5.15	5.00	.....	4.60	.....	4.87
18	5.51	5.57	5.55	.....	.....	5.75	5.09	5.00	.....	4.64	[a] 4.80	4.86
19	5.50	5.57	5.56	6.95	.....	5.71	5.10	5.00	.....	.....	4.80	4.86
20	5.50	5.57	5.57	6.92	.....	5.70	.....	5.00	.....	.....	4.80	4.99
21	5.50	5.57	5.58	6.86	6.43	5.55	.....	4.99	4.35	[a] 4.60	4.84	5.00
22	5.50	5.58	5.60	6.90	6.32	5.58	[a] 5.00	4.98	4.41	.....	4.82	5.00
23	5.50	5.59	5.68	[a] 6.80	6.32	5.57	5.03	4.93	4.41	.....	4.81	5.00
24	5.50	5.59	5.77	[a] 6.78	6.35	5.48	5.00	4.93	4.39	.....	4.81	5.00
25	5.50	5.59	5.88	[a] 6.75	6.30	5.46	5.03	4.91	4.35	.....	4.81	5.00
26	5.50	5.59	5.90	[a] 6.70	6.20	5.45	5.18	4.89	4.35	.....	4.81	5.00
27	5.50	5.58	5.94	[a] 6.70	6.15	5.50	5.03	4.89	4.39	.....	4.82	5.00
28	5.50	5.58	6.04	[a] 6.70	6.12	5.49	4.99	4.89	.....	[a] 4.50	4.83	5.00
29	5.50	.....	6.09	[a] 6.65	6.13	5.51	5.00	4.89	.....	4.55	4.83	4.99
30	5.50	.....	6.15	6.55	6.12	5.48	5.00	4.88	[a] 4.40	4.54	4.83	[a] 4.99
31	5.50	.....	6.21	.....	5.95	.....	5.02	4.82	.....	4.60	.....	4.99

[a] Friez gage out of order, daily gage heights from one reading of staff gage.

NOTE.—Daily gage height is mean for 24 hours ending at noon, except as noted. Due to inaccuracies of the automatic gage these values may be in error several hundredths of a foot and during the month of September four or five tenths of a foot, but the figures given are believed to be the most nearly correct obtainable after a careful study of the automatic gage sheets and the observer's readings on the staff gage. The lake was frozen on the gage Jan. 1 to Mar. 7 and probably Dec. 18 to 31.

LINK RIVER AT KLAMATH FALLS, OREG.

Location.—At the county bridge over Link River at Klamath Falls in sec. 32, T. 38 S., R. 9 E., 1¼ miles below the outlet of Upper Klamath Lake and at the immediate head of Lake Ewauna.

Records available.—May 15, 1904, to December 31, 1911.

Drainage area.—3,110 square miles.

Gages.—Chain gage at the bridge and Friez automatic gage in rapids above bridge. The chain gage was removed July 12, 1912, on account of reconstruction of the bridge, and reinstalled August 20, 1912, at an arbitrary datum.

Channel.—Permanent at both gages; current swift at upper gage, sluggish at lower gage. In the 1¼ miles between Upper Klamath Lake and Lake Ewauna the river falls 70 feet.

Discharge measurements.—Made at the bridge.

Diversions.—Water is diverted in the Keno Canal around the Friez gage. Part of this is used to supply the power plant operated by Moore Bros., and the remainder is wasted at a spillway. Both power plant and spillway are located above the bridge and below the Friez gage. All the water therefore passes the bridge gage and is included in the measurements but does not pass the Friez gage. There is no record of amount diverted except a few miscellaneous measurements which do not include water wasted from spillway.

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Accuracy.—The records prior to June 6, 1908, especially the individual daily records are not reliable. For longer periods—a month or more—the determination of mean flow can probably be accepted as not greatly in error. This condition is accounted for by the effect of wind on the discharge at this station. The gage until May 8, 1908, was located at the bridge at the upper end of Lake Ewauna. At the outlet of Upper Klamath Lake the river breaks over a rather shallow ledge. A strong wind upstream blows the water back from this outlet and at the same time increases the height of water on the gage by backing the water in Lake Ewauna. Thus we have diminished flow with increased gage height. So great is this wind effect that the river has been known to go entirely dry for a few hours at a time. When the wind is downstream the flow of Link River is greatly increased; but owing to the large surface of Lake Ewauna this increase in flow is not shown by the gage heights. In the long run these wind effects are no doubt compensating, but little dependence can be placed in the published daily records prior to March 7, 1907. On this date an anemometer was installed on the bridge and a ship's taffrail log was trailed in the water under the bridge. It was hoped that the daily reading from this log would afford some indication of the velocities with the anemometer records. Although the records obtained by this device were much more reliable during 1907 than previously, even they were not all that could be desired. It became evident that owing to the sudden changes of the wind complete data could not be obtained without automatic recording devices on both the log and anemometer. The method was effective, however, in reducing the probable error of the estimates from about 15 per cent to within less than 5 per cent. On June 6, 1908, a Friez gage was installed in the rapids, where it could be affected only by change in flow, measurements being made at the bridge as formerly. In addition to this the automatic gage was damaged by logs, and its readings at times affected by log jams. As a result the records published for 1910 and the last part of 1909 are subject to considerable uncertainty and no discharges can be computed for 1911.

Cooperation.—This station has been maintained by the United States Reclamation Service since May, 1909.

Discharge measurements of Link River at Klamath Falls, Oreg., in 1910–11.

Date.	Hydrographer.	Chain gage.	Friez gage.	Discharge.
1910.		*Feet.*	*Feet.*	*Sec.-ft.*
Mar. 17	John Yadon	5.08	3.20	4,520
July 29	do	2.90	a1.10	1,180
Aug. 25	L. Moser	2.57	a.82	1,160
Dec. 12	do	3.90	a2.30	3,320
18	do	4.12	a2.48	3,640
28	do	4.15	a2.29	3,240
1911.				
Jan. 7	L. Moser	4.12	2.14	3,010
June 1	do	4.88	2.55	3,830
20	do	4.40	2.22	2,970
July 1	do	4.18	1.83	2,290
Aug. 27	do	2.69	1.09	1,280
Nov. 21	do	3.05	1.50	1,920

a Automatic gage not read at time of measurement; gage height is the mean for the day

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Discharge measurements of Moore Bros.' flume near Klamath Falls, Oreg., in 1910–1912.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1910.	*Feet.*	*Sec.-ft.*	1911.	*Feet.*	*Sec.-ft.*
June 9	2.41	133	Nov. 22	1.52	213
13	2.60	130	24	1.49	200
1911.			27	1.56	200
July 28	1.37	135	1912.		
Sept. 25	.98	214	Jan. 30	(a)	194
26	1.00	210			

a Automatic gage not working.

NOTE.—Gage heights refer to automatic gage on Link River and are the mean daily records.

Daily gage height, in feet, of Link River at Klamath Falls, Oreg., for 1911.

[Friez automatic gage.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.28	1.95	1.66	3.15	3.48	.....	2.20	1.57	.....	.....	1.16	.....
2	2.25	1.94	1.62	3.18	3.63	.....	2.20	1.53	.....	.....	1.16	1.58
3	2.22	1.64	1.61	3.09	3.40	.....	2.21	1.53	0.99	1.21	1.16	1.65
4	2.20	1.47	1.72	.....	2.72	.....	2.21	1.70	1.15	1.30	1.12	.....
5	2.19	1.48	1.72	.....	2.90	.....	.....	1.62	1.09	1.22	1.10	.....
6	2.18	1.49	1.73	.....	.....	.....	.....	.....	.98	1.22	1.08	.....
7	2.16	1.49	1.77	.....	.....	.....	.....	.....	1.02	1.10	1.10	.....
8	2.15	1.49	1.55	.....	3.05	.....	1.80	.....	1.01	.....	1.13	.....
9	2.14	1.55	1.50	.....	3.08	.....	1.80	.....	1.05	1.25	.....	1.38
10	2.14	1.61	1.50	.....	3.06	.....	1.90	.....	.....	1.24	.....	1.37
11	2.18	1.70	1.51	.....	3.13	.....	1.90	1.20	.89	1.22	1.28	1.40
12	2.18	1.71	1.50	.....	3.10	.....	.....	.....	.89	1.20	1.20	1.39
13	2.16	1.71	1.85	.....	3.15	.....	.....	.....	1.02	.....	1.18	1.38
14	2.14	1.71	1.90	.....	3.15	.....	.....	1.20	.98	.....	1.31	1.38
15	2.15	1.70	2.15	.....	3.05	.....	.....	1.18	.95	1.12	1.62	1.38
16	.....	1.70	2.40	.....	2.98	.....	.....	1.15	1.03	1.05	1.50	1.38
17	.....	1.70	2.45	.....	2.96	.....	.....	1.18	.....	1.13	.....	1.37
18	.....	1.70	.....	.....	.....	.....	.....	1.16	.....	1.18	1.50	1.35
19	.....	1.70	.....	.....	2.89	2.50	.....	1.18	.....	1.12	1.51	1.36
20	.....	1.70	.....	.....	2.93	2.35	.....	1.13	.....	1.10	1.65	1.34
21	2.10	1.70	.....	.....	3.05	2.25	.....	1.13	.....	1.00	1.52	1.33
22	2.10	1.68	.....	.....	3.12	2.32	1.60	1.02	.....	1.03	1.49	1.33
23	2.09	1.67	.....	.....	3.05	2.31	1.45	1.05	.....	1.02	1.49	.....
24	2.05	1.67	.....	.....	3.05	2.24	1.05	.99	.....	1.10	1.50	.....
25	2.07	1.68	3.00	.....	.....	2.21	1.30	.97	.....	1.30	1.54	.....
26	2.06	1.71	3.05	.....	.....	2.38	1.25	1.09	1.04	1.20	1.56	.....
27	2.05	1.70	3.10	.....	.....	2.42	1.29	1.01	1.08	1.05	.....	.....
28	2.07	1.69	3.18	.....	.....	2.48	1.37	1.03	1.06	1.10	.....	.....
29	1.96	.....	3.25	3.65	.....	2.37	1.39	1.01	1.10	1.06	.....	.....
30	1.96	.....	3.30	3.50	.....	2.25	1.45	.98	.....	1.12	.....	.....
31	1.94	.....	3.35	.....	.....	.....	1.57	1.10	.....	1.18	.....	.....

NOTE.—Accuracy of automatic-gage record doubtful July 8–15 account of logs on the riffle below. Aug. 6–10 and Oct. 8 gage heights known to be affected by backwater from log jams.

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Daily gage height, in feet, of Link River at Klamath Falls, Oreg., for 1911.

[Gage at bridge. Harold Sargeant, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.16	4.20	4.00	4.17	5.05	4.85	4.10	.....	2.70	2.68	2.85	3.08
2	4.15	4.25	3.99	4.10	5.07	4.82	4.10	.....	2.70	2.70	2.86	3.08
3	4.15	4.11	4.05	4.25	5.00	4.79	4.09	.....	2.65	2.74	2.85	3.08
4	4.13	4.05	4.00	4.30	5.02	4.79	4.03	.....	2.65	2.75	2.86	3.08
5	4.11	4.05	4.05	4.00	5.05	4.83	4.00	.....	2.65	2.74	2.89	3.08
6	4.10	4.00	4.17	4.35	5.10	4.69	4.01	.....	2.63	2.74	2.88	3.09
7	4.15	4.02	4.15	4.35	5.10	4.70	4.00	.....	2.65	2.74	2.90	3.08
8	4.10	4.00	3.99	4.57	5.07	4.69	3.97	.....	2.65	2.74	2.91	3.07
9	4.25	4.00	4.00	4.65	5.02	4.68	3.94	.....	2.65	2.74	2.90	3.09
10	4.26	4.15	3.96	4.60	5.07	4.60	3.89	.....	2.65	2.74	2.89	3.10
11	4.23	4.18	3.95	4.70	5.05	4.60	3.85	.....	2.65	2.74	2.90	3.08
12	4.25	4.17	3.95	4.73	5.05	4.61	.....	.....	2.60	2.74	2.91	3.07
13	4.23	4.10	3.95	4.70	5.02	4.60	.....	.....	2.62	2.73	2.92	3.08
14	4.20	4.10	3.95	4.65	5.05	4.56	.....	.....	2.62	2.94	2.93	3.08
15	4.25	4.05	4.05	4.70	5.05	4.56	.....	.....	2.62	2.74	.....	3.09
16	4.20	4.10	4.00	4.70	5.15	4.51	.....	.....	2.60	2.73	.....	3.09
17	4.30	4.06	4.05	4.87	5.05	4.47	.....	.....	2.60	2.74	.....	3.11
18	4.35	4.10	4.01	4.85	5.20	4.43	.....	.....	2.57	2.74	.....	3.12
19	4.25	4.05	4.05	4.90	5.02	4.47	.....	.....	2.59	2.75	.....	3.13
20	4.25	4.16	4.05	4.91	4.95	4.43	.....	2.72	2.62	2.79	.....	3.16
21	4.27	4.05	4.05	4.90	4.95	4.37	.....	2.73	2.62	2.80	.....	3.18
22	4.27	4.02	4.08	4.50	4.94	4.36	.....	2.70	2.62	2.80	.....	3.20
23	4.32	3.95	4.10	4.85	5.00	4.34	.....	2.70	2.62	2.81	.....	3.23
24	4.30	4.01	4.05	4.80	4.93	4.33	.....	2.70	2.62	2.80	.....	3.25
25	4.35	3.90	4.05	4.85	4.92	4.33	.....	2.70	2.60	2.79	3.08	3.24
26	4.38	3.95	4.09	5.02	4.87	4.27	.....	2.75	2.62	2.80	3.09	3.25
27	4.40	3.90	4.05	5.05	4.87	4.23	.....	2.70	2.62	2.81	3.10	3.23
28	4.27	3.95	4.05	5.01	4.92	4.24	.....	2.70	2.65	2.81	3.09	.....
29	4.35	.....	4.07	5.00	4.90	4.20	.....	2.70	2.65	2.82	3.08	.....
30	4.20	.....	4.10	5.05	4.87	4.15	.....	2.70	2.67	2.84	3.09	.....
31	4.20	.....	4.15	.....	4.87	.....	.....	2.70	.....	2.85	.....	.....

KLAMATH RIVER AT KENO, OREG.

Location.—At the county bridge over Klamath River at the lower end of the lakes and marshes that form the headwaters of the river, in sec. 31, T. 39 S., R. 8 E.

Records available.—May 31, 1904, to December 31, 1911.

Drainage area.—3,150 square miles (excluding lower Klamath Lake drainage area).

Gage.—Vertical staff nailed to bridge; datum unchanged.

Channel.—Immediately below the station the river breaks over a rocky ledge with a fall of about 200 feet to the mile. At low stages a growth of aquatic plants clogs the channel.

Discharge measurements.—Made from a cable 1,000 feet below the gage. No measurements made during 1911.

Winter flow.—River usually freezes over, but as the water is comparatively deep and the ice is not very thick the relation between gage height and discharge is not greatly affected.

Accuracy.—Relation of gage height to discharge affected by back water caused by a growth of aquatic plants in the section and also by the effect of wind on the wide expanse of water above the station. A strong upstream wind will blow the water back from the outlet and diminish the flow, but as the gage is 1,000 feet above the measuring section the gage heights are not always affected to a corresponding degree. On account of lack of measurements no estimates are attempted for 1911.

Cooperation.—This station has been maintained by the United States Reclamation Service since May, 1909.

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Daily gage height, in feet, of Klamath River at Keno, Oreg., for 1911.

[H. Snowgoose, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.0	13 2	12.9	13.0	13.5	13.6	13.1	12.35	11.95	11.95	12.15	12.35
2	13.0	13.2	12.9	13.0	13.5	13.6	13.0	12.35	11.95	11.95	12.15	12.35
3	13.0	13.1	13.0	12.9	13.5	13.6	13.0	12.35	11.9	12.0	12.15	12.35
4	13.0	13.0	13.0	13.0	13.7	13.6	13.0	12.3	11.9	11.95	12.15	12.4
5	13.0	13.0	13.0	13.0	13.6	13.5	13.0	12.3	11.82	11.95	12.1	12.45
6	13.0	13.0	13.0	13.1	13.7	13.5	12.9	12.25	11.95	12.05	12.1	12.4
7	13.0	13.0	13.0	13.2	13.6	13.5	12.9	12.2	11.95	12.05	12.15	12.4
8	13.0	13.0	13.0	13.2	13.6	13.5	12.9	12.2	11.9	12.05	12.04	12.4
9	13.0	13.0	13.0	13.2	13.6	13.5	12.9	12.25	11.9	11.96	12.05	12.4
10	13.0	13.1	13.0	13.2	13.6	13.4	12.8	12.2	11.95	12.0	12.25	12.4
11	13.0	13.1	13.0	13.3	13.6	13.4	12.8	12.2	11.95	12.0	12.25	12.45
12	13.0	13.1	13.0	13.3	13.5	13.4	12.8	12.2	12.0	12.05	12.25	12.45
13	13.0	13.0	13.0	13.4	13.6	13.4	12.8	12.15	11.9	12.15	12.25	12.45
12	13.0	13.0	13.0	13.4	13.7	13.4	12.8	12.2	11.85	11.93	12.25	12.45
15	13.0	13.0	13.0	13.4	13.6	13.4	12.8	12.1	11.85	12.05	12.25	12.45
16	13.0	13.0	13.0	13.4	13.6	13.3	12.8	12.1	11.9	12.05	12.25	12.45
17	13.1	13.0	13.0	13.4	13.6	13.2	12.8	12.1	11.9	12.05	12.25	12.45
18	13.1	13.0	13.0	13.4	13.6	13.3	12.8	12.1	11.9	12.05	12.3	12.45
19	13.1	13.0	13.0	13.4	13.7	13.3	12.7	12.0	11.9	12.05	12.3	12.45
20	13.1	13.0	13.0	13.4	13.6	13.3	12.7	12.05	11.96	12.1	12.3	12.45
21	13.1	13.0	13.0	13.4	13.6	13.3	12.6	12.05	11.82	12.1	12.3	12.45
22	13.1	13.0	13.0	13.4	13.6	13.2	12.6	12.05	11.9	12.05	12.3	12.45
23	13.1	13.0	12.9	13.5	13.5	13.1	12.6	12.05	11.9	12.05	12.35	12.45
24	13.1	13.0	13.0	13.5	13.6	13.2	12.6	12.05	11.96	12.1	12.35	12.45
25	13.1	13.0	13.0	13.5	13.6	13.2	12.45	12.05	11.9	12.1	12.3	12.45
26	13.1	13.0	13.0	13.5	13.6	13.1	12.45	12.05	12.0	12.1	12.35	12.45
27	13 1	12.9	13.0	13.5	13.6	13.1	12.45	12.0	11.85	12.1	12.35	12.45
28	13.1	12.9	13.0	13.5	13.6	13.0	12.45	12.0	11.95	12.1	12.35	12.45
29	13.1	.....	13.0	13.5	13.6	13.0	12.4	12.0	11.95	12.1	12.35	12.45
30	13.1	.....	13.0	13.5	13.6	13.0	12.4	12.0	11.95	12.1	12.35	12.45
31	13.2	.....	13.0	.....	13.6	13.1	12.4	11.95	.....	12.15	.....	12.45

NOTE.—Ice reported Feb. 7–16 and Dec. 23–31.

KLAMATH RIVER NEAR HAPPY CAMP, CAL.

Location.—At Evans Ferry, in the NW. ¼ sec. 16, T. 16 N., R. 8 E., Humboldt meridian, about 4 miles southeast of Happy Camp. Indian Creek enters 3½ miles below the station.

Records available.—September 10 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections on left bank. Low-water section is 60 feet and upper section 1,200 feet below ferry cable.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from suspension bridge about 2,000 feet above gage.

Diversions.—Water is diverted from the main river and tributaries, above the station, for use in irrigation, placer mining, and power development.

The following discharge measurement was made by G. T. Peekema:

September 10, 1911: Gage height, 2.55 feet; discharge, 1,670 second-feet.

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REDWOOD CREEK BASIN.

REDWOOD CREEK NEAR KORBEL, CAL.

Location.—At highway bridge at Bair's ranch, in the SE. ¼ sec. 28, T. 7 N., R. 3 E., Humboldt meridian, 200 feet above Minor Creek and about 9 miles northeast of Korbel.

Records available.—September 4 to December 31, 1911.

Drainage area.—81 square miles.

Gage.—Temporary staff gage located just above mouth of Minor Creek used September 4 to October 14, when permanent chain gage was installed on downstream side of bridge to same datum as staff gage. Length of chain, 35.10 feet.

Channel.—Sand and gravel; will probably shift slightly at high stages.

Discharge measurements.—Made from bridge at gage and by wading.

Discharge measurements of Redwood Creek near Korbel, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 4	E. O. Christiansen	5.25	[a]2
Oct. 14[b]	do	5.75	14
Dec. 28[c]	do	6.88	151

[a] Estimated. [b] Made by wading 100 feet above gage. [c] Made by wading 20 feet below gage.

Daily gage height, in feet, of Redwood Creek near Korbel, Cal., for 1911.

[John Johnson, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	5.32	5.30	5.65	16	5.30	5.48	6.80	5.94
2	.....	5.36	5.30	5.65	17	5.30	5.45	6.40	6.44
3	.....	5.50	5.30	5.65	18	5.30	5.41	6.12	6.12
4	5.28	5.70	5.30	5.65	19	5.30	5.42	6.00	6.08
5	5.31	5.62	5.32	5.68	20	5.29	5.42	5.90	6.15
6	5.32	5.54	5.34	5.80	21	5.25	5.45	5.86	6.01
7	5.35	5.50	5.35	6.00	22	5.25	5.55	5.80	5.95
8	5.34	5.60	5.48	5.88	23	5.25	5.45	5.76	6.20
9	5.32	5.84	5.95	5.80	24	5.25	5.45	5.75	6.22
10	5.30	5.49	6.35	5.76	25	5.30	5.42	5.70	6.16
11	5.30	5.40	5.65	5.75	26	5.35	5.42	5.70	6.10
12	5.30	5.38	5.52	5.70	27	5.35	5.30	5.70	7.02
13	5.30	5.48	6.20	5.70	28	5.35	5.30	5.70	6.88
14	5.30	5.65	6.00	5.68	29	5.35	5.30	5.68	5.50
15	5.30	5.61	7.30	5.72	30	5.32	5.30	5.65	6.38
					31	.....	5.30	.....	6.82

NOTE.—Possibly slight error in gage heights Sept. 4 to Oct. 14 due to slope of water surface between the two gage sites (see description).

REDWOOD CREEK AT ORICK, CAL.

Location.—At highway bridge at Orick, in the NE. ¼ sec. 4, T. 10 N., R. 1 E., Humboldt meridian, about 1½ miles above mouth.

Records available.—September 10 to December 31, 1911.

Drainage area.—262 square miles.

Gage.—Chain gage on upstream side of bridge near left bank. Length of chain, 33.01 feet.

Channel.—Gravel and sand; may shift slightly at high stages.

Discharge measurements.—Made from highway bridge and by wading.

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Discharge measurements of Redwood Creek at Orick, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 10[a]	E. O. Christiansen	5.21	19
Dec. 17[b]	do	6.75	432

[a] Made by wading at gage. [b] Made by wading 150 feet below gage.

Daily gage height, in feet, of Redwood Creek at Orick, Cal., for 1911.

[R. F. Gruber, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	5.16	5.15	5.28	16	5.18	5.49	6.62	5.80
2	.....	5.15	5.14	5.22	17	5.16	5.46	6.25	6.02
3	.....	5.14	5.12	5.20	18	5.15	5.44	6.00	6.05
4	.....	5.12	5.12	5.28	19	5.14	5.41	5.60	5.70
5	.....	5.19	5.12	5.45	20	5.12	5.36	5.25	5.50
6	.....	5.28	5.16	5.52	21	5.11	5.28	5.45	5.38
7	.....	5.35	5.22	5.48	22	5.10	5.22	5.65	5.30
8	.....	5.40	5.32	5.38	23	5.10	5.22	5.62	5.36
9	.....	5.42	5.75	5.32	24	5.10	5.20	5.59	5.45
10	5.20	5.45	6.52	5.25	25	5.14	5.18	5.56	5.55
11	5.20	5.45	6.48	5.20	26	5.20	5.18	5.52	5.85
12	5.20	5.48	6.40	5.20	27	5.20	5.18	5.50	6.55
13	5.20	5.48	6.35	5.35	28	5.20	5.16	5.48	7.25
14	5.20	5.50	6.45	5.52	29	5.19	5.15	5.39	7.55
15	5.20	5.50	6.58	5.61	30	5.18	5.15	5.32	7.75
					31	.....	5.15	.....	8.10

KLAMATH RIVER BASIN.

SPRAGUE RIVER AT CHILOQUIN, OREG.

Location.—In sec. 3, T. 35 S., R. 7 E., at the Southern Pacific Railroad bridge at Chiloquin, 200 feet above the junction of Sprague and Williamson rivers.

Records available.—July 25, 1911, to December 31, 1911.

Gage.—Chain gage on railroad bridge.

Channel.—Rocky and probably permanent in main channel. The overflow channel is piled up with gravel and may shift in floods.

Accuracy.—Conditions are fair and good results should be obtained.

Diversions.—Above the forks of Sprague River there is a considerable amount of diversion for irrigation. At present there are no diversions below the forks, but a canal is being built to divert water a short distance above this station.

Cooperation.—This station is maintained by the United States Reclamation Service and the records are worked up and published by the Survey.

Discharge measurements of Sprague River at Chiloquin, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 25	L. Moser	1.00	513
Aug 28	R. W. Davenport	.98	428
Nov. 21	W. O. Harmon	1.22	424

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Daily gage height, in feet, of Sprague River at Chiloquin, Oreg., for 1911.

[Alfred Gentry, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	1.0	1.0	1.1	1.1	1.2	16.....	1.0	1.0	1.1	1.2	1.2
2.....	1.0	1.0	1.1	1.1	1.2	17.....	1.0	1.0	1.1	1.2	1.2
3.....	1.0	1.0	1.1	1.1	1.2	18.....	1.0	1.0	1.1	1.2	1.2
4.....	1.0	1.0	1.1	1.1	1.2	19.....	1.0	1.0	1.1	1.2	1.2
5.....	1.0	1.0	1.1	1.1	1.2	20.....	1.0	1.0	1.1	1.2	1.2
6.....	1.0	1.0	1.1	1.1	1.2	21.....	1.0	1.0	1.1	1.2	1.2
7.....	1.0	1.0	1.1	1.1	1.2	22.....	1.0	1.0	1.1	1.2	1.2
8.....	1.0	1.0	1.1	1.1	1.2	23.....	1.0	1.0	1.1	1.2	1.2
9.....	1.0	1.0	1.1	1.1	1.2	24.....	1.0	1.0	1.1	1.2	1.2
10.....	1.0	1.0	1.1	1.1	1.2	25.....	1.0	1.0	1.1	1.2	1.2
11.....	1.0	1.0	1.1	1.2	1.2	26.....	1.0	1.0	1.1	1.2	1.2
12.....	1.0	1.0	1.1	1.2	1.2	27.....	1.0	1.0	1.1	1.2	1.1
13.....	1.0	1.0	1.1	1.2	1.2	28.....	1.0	1.1	1.1	1.2	1.1
14.....	1.0	1.0	1.1	1.2	1.2	29.....	1.0	1.1	1.1	1.2	1.1
15.....	1.0	1.0	1.1	1.2	1.2	30.....	1.0	1.1	1.1	1.2	1.1
						31.....	1.0	.....	1.1	.....	1.1

UPPER KLAMATH LAKE NEAR KLAMATH FALLS, OREG.

Location.—In sec. 30, T. 38 S., R. 9 E., near Klamath Falls, Oreg.

Records available.—May 28, 1904, to December 31, 1911.

Drainage area.—3,110 square miles, at the outlet of lake.

Gage.—Friez automatic, installed February 16, 1906; referred to level of a staff gage installed May 28, 1904. Elevation of zero of staff gage 4,136.13 feet above sea level. Gage heights since February 16, 1906, are the means of the daily records obtained from the automatic gage.

Diversions.—Water is diverted from the lake to the main canal of the Klamath project of the United States Reclamation Service.

Fluctuations of lake level.—The level of the water surface of Klamath Lake is strongly affected by wind. When the wind blows from the south the water may be lowered as much as 6 inches near the outlet; when the wind is from the north the water surface may be raised 6 inches above its normal level; differences of a foot may be noticed within a few hours. If the effect of wind were eliminated, the record of lake heights would show much more gradual changes than are indicated by the following tables.

Cooperation.—Station maintained by the United States Reclamation Service since May, 1909.

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Daily gage height, in feet, of Upper Klamath Lake near Klamath Falls, Oreg., for 1911.

[Jas. Newnham and Graham Kiehl, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.60	5.50	5.58	6.28	6.53	5.97	5.40	5.07	4.87	4.49	4.63	4.84
2	5.60	5.50	5.57	6.30	6.56	6.00	5.31	5.04	4.88	4.53	4.63	4.84
3	5.60	5.50	5.56	6.30	6.50	6.00	5.34	5.02	4.88	4.48	4.63	4.85
4	5.60	5.50	5.55	6.26	6.28	6.02	5.37	5.01	4.86	4.48	4.69	4.85
5	5.60	5150	5.54	6.23	6.57	5.95	5.33	5.02	4.82	.....	.....	4.83
6	5.60	5.50	5.54	6.42	6.52	5.93	3.35	5.01	4.70	.....	.....	4.95
7	5.60	5.53	5.48	6.44	6.50	5.85	5.38	5.01	4.67	[a] 4.45	.....	5.02
8	5.53	5.53	5.49	6.56	6.40	5.90	5.41	5.01	4.62	4.33	.....	4.98
9	5.51	5.53	5.49	6.35	.....	5.85	5.27	5.08	4.63	4.47	.....	4.98
10	5.51	5.53	5.50	6.40	.....	5.83	5.30	5.00	4.60	4.53	.....	4.98
11	5.52	5.54	5.50	6.45	.....	5.80	5.28	5.01	4.61	4.52	[a] 4.75	4.96
12	5.55	5.54	5.51	6.55	.....	5.82	5.23	5.00	6.64	4.50	.....	4.96
13	5.52	5.55	5.51	6.55	.....	5.88	5.23	5.00	4.83	4.37	.....	4.93
14	5.52	5.56	5.52	6.50	6.55	5.87	5.20	5.00	4.87	4.51	.....	4.90
15	5.52	5.56	5.52	6.55	6.45	5.86	5918	4.99	4.91	4.62	.....	4.89
16	5.52	5.57	5.53	.....	6.40	5.84	5.15	5.00	4.97	4.60	.....	4.86
17	5.51	5.57	5.55	.....	6.38	5.82	5.15	5.00	.....	4.60	.....	4.87
18	5.51	5.57	5.55	.....	.....	5.75	5.09	5.00	.....	4.64	[a] 4.80	4.86
19	5.50	5.57	5.56	6.95	.....	5.71	5.10	5.00	.....	.....	4.80	4.86
20	5.50	5.57	5.57	6.92	.....	5.70	.....	5.00	.....	.....	4.80	4.99
21	5.50	5.57	5.58	6.86	6.43	5.55	.....	4.99	4.35	[a] 4.60	4.84	5.00
22	5.50	5.58	5.60	6.90	6.32	5.58	[a] 5.00	4.98	4.41	.....	4.82	5.00
23	5.50	5.59	5.68	[a] 6.80	6.32	5.57	5.03	4.93	4.41	.....	4.81	5.00
24	5.50	5.59	5.77	[a] 6.78	6.35	5.48	5.00	4.93	4.39	.....	4.81	5.00
25	5.50	5.59	5.88	[a] 6.75	6.30	5.46	5.03	4.91	4.35	.....	4.81	5.00
26	5.50	5.59	5.90	[a] 6.70	6.20	5.45	5.18	4.89	4.35	.....	4.81	5.00
27	5.50	5.58	5.94	[a] 6.70	6.15	5.50	5.03	4.89	4.39	.....	4.82	5.00
28	5.50	5.58	6.04	[a] 6.70	6.12	5.49	4.99	4.89	.....	[a] 4.50	4.83	5.00
29	5.50	.....	6.09	[a] 6.65	6.13	5.51	5.00	4.89	.....	4.55	4.83	4.99
30	5.50	.....	6.15	6.55	6.12	5.48	5.00	4.88	[a] 4.40	4.54	4.83	[a] 4.99
31	5.50	.....	6.21	.....	5.95	.....	5.02	4.82	.....	4.60	.....	4.99

[a] Friez gage out of order, daily gage heights from one reading of staff gage.

NOTE.—Daily gage height is mean for 24 hours ending at noon, except as noted. Due to inaccuracies of the automatic gage these values may be in error several hundredths of a foot and during the month of September four or five tenths of a foot, but the figures given are believed to be the most nearly correct obtainable after a careful study of the automatic gage sheets and the observer's readings on the staff gage. The lake was frozen at the gage Jan. 1 to Mar. 7 and probably Dec. 18 to 31.

LINK RIVER AT KLAMATH FALLS, OREG.

Location.—At the county bridge over Link River at Klamath Falls in sec. 32, T. 38 S., R. 9 E., 1¼ miles below the outlet of Upper Klamath Lake and at the immediate head of Lake Ewauna.

Records available.—May 15, 1904, to December 31, 1911.

Drainage area.—3,110 square miles.

Gages.—Chain gage at the bridge and Friez automatic gage in rapids above bridge. The chain gage was removed July 12, 1912, on account of reconstruction of the bridge, and reinstalled August 20, 1912, at an arbitrary datum.

Channel.—Permanent at both gages; current swift at upper gage, sluggish at lower gage. In the 1¼ miles between Upper Klamath Lake and Lake Ewauna the river falls 70 feet.

Discharge measurements.—Made at the bridge.

Diversions.—Water is diverted in the Keno Canal around the Friez gage. Part of this is used to supply the power plant operated by Moore Bros., and the remainder is wasted at a spillway. Both power plant and spillway are located above the bridge and below the Friez gage. All the water therefore passes the bridge gage and is included in the measurements but does not pass the Friez gage. There is no record of amount diverted except a few miscellaneous measurements which do not include water wasted from spillway.

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Accuracy.—The records prior to June 6, 1908, especially the individual daily records are not reliable. For longer periods—a month or more—the determination of mean flow can probably be accepted as not greatly in error. This condition is accounted for by the effect of wind on the discharge at this station. The gage until May 8, 1908, was located at the bridge at the upper end of Lake Ewauna. At the outlet of Upper Klamath Lake the river breaks over a rather shallow ledge. A strong wind upstream blows the water back from this outlet and at the same time increases the height of water on the gage by backing the water in Lake Ewauna. Thus we have diminished flow with increased gage height. So great is this wind effect that the river has been known to go entirely dry for a few hours at a time. When the wind is downstream the flow of Link River is greatly increased; but owing to the large surface of Lake Ewauna this increase in flow is not shown by the gage heights. In the long run these wind effects are no doubt compensating, but little dependence can be placed in the published daily records prior to March 7, 1907. On this date an anemometer was installed on the bridge and a ship's taffrail log was trailed in the water under the bridge. It was hoped that the daily reading from this log would afford some indication of the velocities with the anemometer records. Although the records obtained by this device were much more reliable during 1907 than previously, even they were not all that could be desired. It became evident that owing to the sudden changes of the wind complete data could not be obtained without automatic recording devices on both the log and anemometer. The method was effective, however, in reducing the probable error of the estimates from about 15 per cent to within less than 5 per cent. On June 6, 1908, a Friez gage was installed in the rapids, where it could be affected only by change in flow, measurements being made at the bridge as formerly. In addition to this the automatic gage was damaged by logs, and its readings at times affected by log jams. As a result the records published for 1910 and the last part of 1909 are subject to considerable uncertainty and no discharges can be computed for 1911.

Cooperation.—This station has been maintained by the United States Reclamation Service since May, 1909.

Discharge measurements of Link River at Klamath Falls, Oreg., in 1910–11.

Date.	Hydrographer.	Chain gage.	Friez gage.	Discharge.
1910.		*Feet.*	*Feet.*	*Sec.-ft.*
Mar. 17	John Yadon	5.08	3.20	4,520
July 29	do	2.90	a1.10	1,180
Aug. 25	L. Moser	2.57	a.82	1,160
Dec. 12	do	3.90	a2.30	3,320
18	do	4.12	a2.48	3,640
28	do	4.15	a2.29	3,240
1911.				
Jan. 7	L. Moser	4.12	2.14	3,010
June 1	do	4.88	2.55	3,830
20	do	4.40	2.22	2,970
July 1	do	4.18	1.83	2,290
Aug. 27	do	2.69	1.09	1,280
Nov. 21	do	3.05	1.50	1,920

a Automatic gage not read at time of measurement; gage height is the mean for the day

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Discharge measurements of Moore Bros.' flume near Klamath Falls, Oreg., in 1910–1912.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1910.	*Feet.*	*Sec.-ft.*	1911.	*Feet.*	*Sec.-ft.*
June 9	2.41	133	Nov. 22	1.52	213
13	2.60	130	24	1.49	200
1911.			27	1.56	200
July 28	1.37	135	1912.		
Sept. 25	.98	214	Jan. 30	(a)	194
26	1.00	210			

a Automatic gage not working.

NOTE.—Gage heights refer to automatic gage on Link River and are the mean daily records.

Daily gage height, in feet, of Link River at Klamath Falls, Oreg., for 1911.

[Friez automatic gage.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.28	1.95	1.66	3.15	3.48	.....	2.20	1.57	.....	.....	1.16	.....
2	2.25	1.94	1.62	3.18	3.63	.....	2.20	1.53	.....	.....	1.16	1.58
3	2.22	1.64	1.61	3.09	3.40	.....	2.21	1.53	0.99	1.21	1.16	1.65
4	2.20	1.47	1.72	.....	2.72	.....	2.21	1.70	1.15	1.30	1.12	.....
5	2.19	1.48	1.72	.....	2.90	.....	.....	1.62	1.09	1.22	1.10	.....
6	2.18	1.49	1.73	.....	.....	.....	.....	.....	.98	1.22	1.08	.....
7	2.16	1.49	1.77	.....	.....	.....	.....	.....	1.02	1.10	1.10	.....
8	2.15	1.49	1.55	.....	3.05	.....	1.80	.....	1.01	.....	1.13	.....
9	2.14	1.55	1.50	.....	3.08	.....	1.80	.....	1.05	1.25	.....	1.38
10	2.14	1.61	1.50	.....	3.06	.....	1.90	.....	.....	1.24	.....	1.37
11	2.18	1.70	1.51	.....	3.13	.....	1.90	1.20	.89	1.22	1.28	1.40
12	2.18	1.71	1.50	.....	3.10	.....	.....	.....	.89	1.20	1.20	1.39
13	2.16	1.71	1.85	.....	3.15	.....	.....	.....	1.02	.....	1.18	1.38
14	2.14	1.71	1.90	.....	3.15	.....	.....	1.20	.98	.....	1.31	1.38
15	2.15	1.70	2.15	.....	3.05	.....	.....	1.18	.95	1.12	1.62	1.38
16	.....	1.70	2.40	.....	2.98	.....	.....	1.15	1.03	1.05	1.50	1.38
17	.....	1.70	2.45	.....	2.96	.....	.....	1.18	.....	1.13	.....	1.37
18	.....	1.70	.....	.....	.....	.....	.....	1.16	.....	1.18	1.50	1.35
19	.....	1.70	.....	.....	2.89	2.50	.....	1.18	.....	1.12	1.51	1.36
20	.....	1.70	.....	.....	2.93	2.35	.....	1.13	.....	1.10	1.65	1.34
21	2.10	1.70	.....	.....	3.05	2.25	.....	1.13	.....	1.00	1.52	1.33
22	2.10	1.68	.....	.....	3.12	2.32	1.60	1.02	.....	1.03	1.49	1.33
23	2.09	1.67	.....	.....	3.05	2.31	1.45	1.05	.....	1.02	1.49	.....
24	2.05	1.67	.....	.....	3.05	2.24	1.05	.99	.....	1.10	1.50	.....
25	2.07	1.68	3.00	.....	.....	2.21	1.30	.97	.....	1.30	1.54	.....
26	2.06	1.71	3.05	.....	.....	2.38	1.25	1.09	1.04	1.20	1.56	.....
27	2.05	1.70	3.10	.....	.....	2.42	1.29	1.01	1.08	1.05	.....	.....
28	2.07	1.69	3.18	.....	.....	2.48	1.37	1.03	1.06	1.10	.....	.....
29	1.96	.....	3.25	3.65	.....	2.37	1.39	1.01	1.10	1.06	.....	.....
30	1.96	.....	3.30	3.50	.....	2.25	1.45	.98	.....	1.12	.....	.....
31	1.94	.....	3.35	.....	.....	.....	1.57	1.10	.....	1.18	.....	.....

NOTE.—Accuracy of automatic-gage record doubtful July 8–15 account of logs on the riffle below. Aug. 6–10 and Oct. 8 gage heights known to be affected by backwater from log jams.

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Daily gage height, in feet, of Link River at Klamath Falls, Oreg., for 1911.

[Gage at bridge. Harold Sargeant, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.16	4.20	4.00	4.17	5.05	4.85	4.10	.....	2.70	2.68	2.85	3.08
2	4.15	4.25	3.99	4.10	5.07	4.82	4.10	.....	2.70	2.70	2.86	3.06
3	4.15	4.11	4.05	4.25	5.00	4.79	4.09	.....	2.65	2.74	2.85	3.08
4	4.13	4.05	4.00	4.30	5.02	4.79	4.03	.....	2.65	2.75	2.86	3.08
5	4.11	4.05	4.05	4.00	5.05	4.83	4.00	.....	2.65	2.74	2.89	3.08
6	4.10	4.00	4.17	4.35	5.10	4.69	4.01	.....	2.63	2.74	2.88	3.09
7	4.15	4.02	4.15	4.35	5.10	4.70	4.00	.....	2.65	2.74	2.90	3.08
8	4.10	4.00	3.99	4.57	5.07	4.69	3.97	.....	2.65	2.74	2.91	3.07
9	4.25	4.00	4.00	4.65	5.02	4.68	3.94	.....	2.65	2.74	2.90	3.09
10	4.26	4.15	3.96	4.60	5.07	4.60	3.89	.....	2.65	2.74	2.89	3.10
11	4.23	4.18	3.95	4.70	5.05	4.60	3.85	.....	2.65	2.74	2.90	3.08
12	4.25	4.17	3.95	4.73	5.05	4.61	.....	.....	2.60	2.74	2.91	3.07
13	4.23	4.10	3.95	4.70	5.02	4.60	.....	.....	2.62	2.73	2.92	3.08
14	4.20	4.10	3.95	4.65	5.05	4.56	.....	.....	2.62	2.94	2.93	3.08
15	4.25	4.05	4.05	4.70	5.05	4.56	.....	.....	2.62	2.74	.....	3.09
16	4.20	4.10	4.00	4.70	5.15	4.51	.....	.....	2.60	2.73	.....	3.09
17	4.30	4.06	4.05	4.87	5.05	4.47	.....	.....	2.60	2.74	.....	3.11
18	4.35	4.10	4.01	4.85	5.20	4.43	.....	.....	2.57	2.74	.....	3.12
19	4.25	4.05	4.05	4.90	5.02	4.47	.....	.....	2.59	2.75	.....	3.13
20	4.25	4.16	4.05	4.91	4.95	4.43	.....	2.72	2.62	2.79	.....	3.16
21	4.27	4.05	4.05	4.90	4.95	4.37	.....	2.73	2.62	2.80	.....	3.18
22	4.27	4.02	4.08	4.50	4.94	4.36	.....	2.70	2.62	2.80	.....	3.20
23	4.32	3.95	4.10	4.85	5.00	4.34	.....	2.70	2.62	2.81	.....	3.23
24	4.30	4.01	4.05	4.80	4.93	4.33	.....	2.70	2.62	2.80	.....	3.25
25	4.35	3.90	4.05	4.85	4.92	4.33	.....	2.70	2.60	2.79	3.08	3.24
26	4.38	3.95	4.09	5.02	4.87	4.27	.....	2.75	2.62	2.80	3.09	3.25
27	4.40	3.90	4.05	5.05	4.87	4.23	.....	2.70	2.62	2.81	3.10	3.23
28	4.27	3.95	4.05	5.01	4.92	4.24	.....	2.70	2.65	2.81	3.09	.....
29	4.35	.....	4.07	5.00	4.90	4.20	.....	2.70	2.65	2.82	3.08	.....
30	4.20	.....	4.10	5.05	4.87	4.15	.....	2.70	2.67	2.84	3.09	.....
31	4.20	.....	4.15	.....	4.87	.....	.....	2.70	.....	2.85	.....	.....

KLAMATH RIVER AT KENO, OREG.

Location.—At the county bridge over Klamath River at the lower end of the lakes and marshes that form the headwaters of the river, in sec. 31, T. 39 S., R. 8 E.

Records available.—May 31, 1904, to December 31, 1911.

Drainage area.—3,150 square miles (excluding lower Klamath Lake drainage area).

Gage.—Vertical staff nailed to bridge; datum unchanged.

Channel.—Immediately below the station the river breaks over a rocky ledge with a fall of about 200 feet to the mile. At low stages a growth of aquatic plants clogs the channel.

Discharge measurements.—Made from a cable 1,000 feet below the gage. No measurements made during 1911.

Winter flow.—River usually freezes over, but as the water is comparatively deep and the ice is not very thick the relation between gage height and discharge is not greatly affected.

Accuracy.—Relation of gage height to discharge affected by back water caused by a growth of aquatic plants in the section and also by the effect of wind on the wide expanse of water above the station. A strong upstream wind will blow the water back from the outlet and diminish the flow, but as the gage is 1,000 feet above the measuring section the gage heights are not always affected to a corresponding degree. On account of lack of measurements no estimates are attempted for 1911.

Cooperation.—This station has been maintained by the United States Reclamation Service since May, 1909.

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Daily gage height, in feet, of Klamath River at Keno, Oreg., for 1911.

[H. Snowgoose, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	13.0	13 2	12.9	13.0	13.5	13.6	13.1	12.35	11.95	11.95	12.15	12.35
2	13.0	13.2	12.9	13.0	13.5	13.6	13.0	12.35	11.95	11.95	12.15	12.35
3	13.0	13.1	13.0	12.9	13.5	13.6	13.0	12.35	11.9	12.0	12.15	12.35
4	13.0	13.0	13.0	13.0	13.7	13.6	13.0	12.3	11.9	11.95	12.15	12.4
5	13.0	13.0	13.0	13.0	13.6	13.5	13.0	12.3	11.82	11.95	12.1	12.45
6	13.0	13.0	13.0	13.1	13.7	13.5	12.9	12.25	11.95	12.05	12.1	12.4
7	13.0	13.0	13.0	13.2	13.6	13.5	12.9	12.2	11.95	12.05	12.15	12.4
8	13.0	13.0	13.0	13.2	13.6	13.5	12.9	12.2	11.9	12.05	12.04	12.4
9	13.0	13.0	13.0	13.2	13.6	13.5	12.9	12.25	11.9	11.95	12.05	12.4
10	13.0	13.1	13.0	13.2	13.6	13.4	12.8	12.2	11.95	12.0	12.25	12.4
11	13.0	13.1	13.0	13.3	13.6	13.4	12.8	12.2	11.95	12.0	12.25	12.45
12	13.0	13.1	13.0	13.3	13.5	13.4	12.8	12.2	12.0	12.05	12.25	12.45
13	13.0	13.0	13.0	13.4	13.6	13.4	12.8	12.15	11.9	12.15	12.25	12.45
12	13.0	13.0	13.0	13.4	13.7	13.4	12.8	12.2	11.85	11.93	12.25	12.45
15	13.0	13.0	13.0	13.4	13.6	13.4	12.8	12.1	11.85	12.05	12.25	12.45
16	13.0	13.0	13.0	13.4	13.6	13.3	12.8	12.1	11.9	12.05	12.25	12.45
17	13.1	13.0	13.0	13.4	13.6	13.2	12.8	12.1	11.9	12.05	12.25	12.45
18	13.1	13.0	13.0	13.4	13.6	13.3	12.8	12.1	11.9	12.05	12.3	12.45
19	13.1	13.0	13.0	13.4	13.7	13.3	12.7	12.0	11.9	12.05	12.3	12.45
20	13.1	13.0	13.0	13.4	13.6	13.3	12.7	12.05	11.95	12.1	12.3	12.45
21	13.1	13.0	13.0	13.4	13.6	13.3	12.6	12.05	11.82	12.1	12.3	12.45
22	13.1	13.0	13.0	13.4	13.6	13.2	12.6	12.05	11.9	12.05	12.3	12.45
23	13.1	13.0	12.9	13.5	13.5	13.1	12.6	12.05	11.9	12.05	12.35	12.45
24	13.1	13.0	13.0	13.5	13.6	13.2	12.6	12.05	11.95	12.1	12.35	12.45
25	13.1	13.0	13.0	13.5	13.6	13.2	12.45	12.05	11.9	12.1	12.3	12.45
26	13.1	13.0	13.0	13.5	13.6	13.1	12.45	12.05	12.0	12.1	12.35	12.45
27	13 1	12.9	13.0	13.5	13.6	13.1	12.45	12.0	11.85	12.1	12.35	12.45
28	13.1	12.9	13.0	13.5	13.6	13.0	12.45	12.0	11.95	12.1	12.35	12.45
29	13.1	.....	13.0	13.5	13.6	13.0	12.4	12.0	11.95	12.1	12.35	12.45
30	13.1	.....	13.0	13.5	13.6	13.0	12.4	12.0	11.95	12.1	12.35	12.45
31	13.2	.....	13.0	.....	13.6	13.1	12.4	11.95	.....	12.15	.....	12.45

NOTE.—Ice reported Feb. 7–16 and Dec. 23–31.

KLAMATH RIVER NEAR HAPPY CAMP, CAL.

Location.—At Evans Ferry, in the NW. ¼ sec. 16, T. 16 N., R. 8 E., Humboldt meridian, about 4 miles southeast of Happy Camp. Indian Creek enters 3½ miles below the station.

Records available.—September 10 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections on left bank. Low-water section is 60 feet and upper section 1,200 feet below ferry cable.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from suspension bridge about 2,000 feet above gage.

Diversions.—Water is diverted from the main river and tributaries, above the station, for use in irrigation, placer mining, and power development.

The following discharge measurement was made by G. T. Peekema:

September 10, 1911: Gage height, 2.55 feet; discharge, 1,670 second-feet.

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Daily gage height, in feet, of Klamath River near Happy Camp, Cal., for 1911.

[Chas. J. Schuffler, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	2.6	2.9	3.3	16	2.55	2.8	3.5	3.3
2	.....	2.65	2.9	3.3	17	2.55	2.8	3.4	3.4
3	.....	2.8	2.9	3.3	18	2.6	2.8	3.3	3.4
4	.....	2.8	2.9	3.3	19	2.6	2.8	3.3	3.3
5	.....	2.7	2.9	3.3	20	2.6	2.8	3.3	3.3
6	.....	2.7	2.9	3.4	21	2.6	2.8	3.3	3.3
7	.....	2.7	3.0	3.3	22	2.6	2.8	3.2	3.4
8	.....	2.8	3.0	3.3	23	2.6	2.8	3.2	3.3
9	.....	3.0	3.0	3.3	24	2.6	2.8	3.2	3.4
10	2.55	2.75	3.0	3.3	25	2.65	2.8	3.2	3.4
11	2.55	2.8	3.0	3.3	26	2.6	2.8	3.2	3.4
12	2.6	2.8	3.0	3.3	27	2.7	2.9	3.2	3.4
13	2.6	2.9	3.1	3.3	28	2.65	2.9	3.2	3.4
14	2.6	3.0	3.1	3.3	29	2.6	2.9	3.2	3.3
15	2.6	2.9	3.5	3.3	30	2.6	2.9	3.2	3.4
					31	.....	2.9	.....	3.5

KLAMATH RIVER NEAR REQUA, CAL.

Location.—At Scofield Ferry, in sec. 29, T. 13 N., R. 2 E., Humboldt meridian, 30 miles below mouth of Trinity River and about 9 miles above Requa and the mouth of the river.

Records available.—December 25, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff in four sections on right bank at ferry cable.

Channel.—Gravel; may shift slightly during high water.

Discharge measurements.—Made from ferryboat.

Diversions.—Water is diverted for irrigation and power development from main river in Oregon and tributaries in California.

Estimates are withheld until additional measurements can be made.

Discharge measurements of Klamath River near Requa, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 6	E. O. Christiansen	5.45	2,980
Dec. 15	.....do	6.36	3,770

NOTE.—Measurements made from ferry boat at gage.

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Daily gage height, in feet, of Klamath River near Requa, Cal., for 1911.

[M. F. Scofield, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.31	15.35	9.84	15.02	12.18	13.02	8.64	6.34	5.43	5.50	5.70	6.32
2	8.26	14.48	9.72	14.78	12.54	12.78	8.55	6.28	5.41	5.50	5.70	6.28
3	8.21	14.28	9.66	14.46	12.68	12.46	8.52	6.24	5.40	5.52	5.70	6.28
4	8.17	14.16	10.00	14.16	12.62	12.13	8.54	6.22	5.40	5.65	5.70	6.28
5	8.13	13.68	11.28	15.14	13.12	11.94	8.54	6.18	5.41	5.65	5.70	6.35
6	8.10	13.19	12.03	15.22	12.86	11.94	8.52	6.14	5.43	5.60	5.70	6.82
7	8.08	12.89	14.61	14.12	12.42	11.73	8.38	.....	5.45	5.60	5.70	6.85
8	8.02	12.24	14.84	.....	12.38	11.62	8.12	.....	5.45	5.62	5.82	6.78
9	8.09	11.94	13.38	13.78	12.22	11.46	7.96	6.00	5.48	5.95	6.12	6.60
10	8.40	11.82	12.88	13.98	11.86	11.48	7.75	5.98	5.45	5.85	6.88	6.52
11	9.04	12.26	12.32	13.90	11.74	11.79	7.68	5.96	5.45	5.85	6.55	6.45
12	8.93	12.19	12.02	13.36	11.82	11.85	7.68	5.93	5.42	5.75	6.20	6.40
13	8.62	12.48	11.88	12.64	11.78	11.80	7.70	5.90	5.50	5.75	6.55	6.35
14	8.59	12.12	11.92	12.58	11.61	11.84	7.74	5.88	5.52	6.00	6.70	6.35
15	8.52	11.66	11.98	12.52	.....	11.66	7.80	5.85	5.50	6.00	8.78	6.35
16	8.54	11.28	12.18	12.46	.....	11.22	7.72	5.81	5.42	5.80	8.98	6.60
17	8.56	11.18	12.49	12.56	11.76	10.93	7.58	5.78	5.40	5.78	7.65	7.02
18	9.78	11.36	12.88	12.62	14.08	10.65	7.46	5.76	5.35	5.70	7.22	6.82
19	14.12	11.16	13.06	12.54	13.47	10.42	7.38	5.72	5.35	5.70	6.90	6.70
20	18.70	11.04	13.24	12.38	12.92	10.30	7.25	5.70	5.35	5.65	6.80	6.62
21	15.08	10.88	13.48	12.34	12.69	10.12	7.14	5.64	5.35	5.65	6.70	6.52
22	13.58	10.68	13.96	12.46	13.00	9.86	7.00	5.62	5.35	5.65	6.60	6.65
23	12.46	10.69	14.36	12.68	13.26	9.56	6.88	5.62	5.32	5.62	6.50	6.80
23	11.65	10.48	14.42	13.28	13.98	9.48	6.84	5.58	5.32	5.65	6.42	6.85
25	11.62	10.42	13.89	13.74	12.52	9.16	6.82	5.55	5.40	5.65	6.38	6.80
26	11.68	10.12	13.42	13.68	11.98	9.12	6.76	5.52	5.50	5.68	6.35	6.82
27	11.64	9.98	13.02	13.36	11.78	9.18	6.65	5.50	5.52	5.70	6.32	7.40
28	12.22	.....	12.88	12.86	11.76	9.16	6.60	5.49	5.55	5.70	6.30	7.60
29	12.46	.....	13.22	12.48	11.86	8.96	6.55	5.48	5.50	5.70	6.32	7.85
30	13.56	.....	13.90	12.26	12.14	8.82	6.49	5.46	5.50	5.70	6.35	7.80
31	15.55	.....	14.58	.....	12.36	.....	6.40	5.45	.....	5.70	.....	7.20

WILLIAMSON RIVER AT CHILOQUIN, OREG.

Location.—In sec. 3, T. 35 S., R. 7 E., at the highway bridge at Chiloquin, just above the mouth of Sprague River.

Records available.—July 25, 1911, to December 31, 1911.

Gage.—Vertical staff on the wagon bridge.

Channel.—Rocks and gravel, probably permanent.

Discharge measurements.—Made from wagon bridge.

Accuracy.—Conditions not very favorable at this station, but fairly reliable results have been obtained.

Cooperation.—This station is maintained by the United States Reclamation Service and the records are worked up and published by the Survey.

Discharge measurements of Williamson River at Chiloquin, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 25	L. Moser	4.00	579
Nov. 21	W. O. Harmon	4.40	740

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Daily gage height, in feet, of Williamson River at Chiloquin, Oreg., for 1911.

[Alfred Gentry, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.0	3.9	3.9	4.2	4.5	16	4.0	3.9	4.0	4.3	4.5
2	4.0	3.9	3.9	4.2	4.5	17	4.0	3.9	4.1	4.3	4.5
3	4.0	3.9	3.9	4.2	4.5	18	4.0	3.9	4.1	4.3	4.5
4	4.0	3.9	3.9	4.2	4.5	19	4.0	3.9	4.1	4.3	4.5
5	4.0	3.9	3.9	4.2	4.5	20	3.9	3.9	4.1	4.3	4.5
6	4.0	3.9	3.9	4.2	4.5	21	3.9	3.9	4.1	4.3	4.4
7	4.0	3.9	3.9	4.2	4.5	22	3.9	3.9	4.1	4.4	4.4
8	4.0	3.9	3.9	4.2	4.5	23	3.9	3.9	4.1	4.4	4.3
9	4.0	3.9	3.9	4.2	4.5	24	3.9	3.9	4.1	4.4	4.3
10	4.0	3.9	3.9	4.2	4.5	25	3.9	3.9	4.1	4.4	4.2
11	4.0	3.9	3.9	4.2	4.5	26	3.9	3.9	4.2	4.4	4.2
12	4.0	3.9	3.9	4.2	4.5	27	3.9	3.9	4.2	4.4	4.2
13	4.0	3.9	4.0	4.2	4.5	28	3.9	3.9	4.2	4.5	4.2
14	4.0	3.9	4.1	4.2	4.5	29	3.9	3.9	4.2	4.5	4.2
15	4.0	3.9	4.1	4.2	4.5	30	3.9	3.9	4.2	4.5	4.2
						31	3.9	.....	4.2	.....	4.2

WOOD RIVER AT FORT KLAMATH, OREG.

Location.—In sec. 22, T. 33 S., R. 7½ E., at a highway bridge one-fourth mile north of Fort Klamath.

Records available.—August 5, 1911, to December 31, 1911.

Gage.—Vertical staff attached to bridge.

Channel.—Clean gravel, liable to shift slightly.

Discharge measurements.—Made from highway bridge.

Accuracy.—Field conditions are excellent at this station and reliable results should be obtained.

Cooperation.—This station is maintained by the United States Reclamation Service and the records are worked up and published by the Survey.

Discharge measurements of Wood River at Fort Klamath, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
July 25	L. Moser	1.45	318
Aug. 5	.....do	1.65	339
30	R. W. Davenport	1.40	295
Nov. 18	W. O. Harmon	1.52	274

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Daily gage height, in feet, of Wood River at Fort Klamath, Oreg., for 1911.

[Guss Page, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.35	1.45	1.40	1.46	16	1.55	1.40	1.45	1.65	1.45
2	.....	1.35	1.45	1.40	1.45	17	1.55	1.40	1.45	1.55	1.40
3	.....	1.35	1.45	1.40	1.45	18	1.55	1.40	1.45	1.60	1.40
4	.....	1.35	1.50	1.40	1.42	19	1.50	1.40	1.45	1.55	1.35
5	1.70	1.35	1.50	1.38	1.45	20	1.50	1.40	1.45	1.50	1.30
6	1.60	1.35	1.45	1.40	1.48	21	1.50	1.40	1.45	1.50	1.20
7	1.60	1.35	1.45	1.45	1.45	22	1.50	1.40	1.45	1.50	1.20
8	1.60	1.35	1.45	1.50	1.43	23	1.50	1.40	1.40	1.48	1.25
9	1.65	1.40	1.45	1.50	1.40	24	1.45	1.45	1.40	1.48	1.25
10	1.65	1.40	1.45	1.50	1.40	25	1.45	1.50	1.40	1.46	1.25
11	1.65	1.40	1.45	1.50	1.40	26	1.45	1.50	1.40	1.45	1.30
12	1.55	1.40	1.45	1.55	1.40	27	1.40	1.50	1.40	1.45	1.30
13	1.60	1.40	1.45	1.60	1.45	28	1.40	1.45	1.40	1.44	1.25
14	1.55	1.40	1.45	1.65	1.48	29	1.40	1.45	1.40	1.45	1.25
15	1.55	1.40	1.45	1.80	1.50	30	1.40	1.45	1.40	1.50	1.27
						31	1.35	.....	1.40	.....	1.30

LOST RIVER AT OLENE, OREG.

Location.—At Olene highway bridge, in sec. 14, T. 39 S., R. 10 E.

Records available.—May 20, 1907, to December 31, 1911.

Drainage area.—1,290 square miles.

Gage.—Vertical staff.

Channel.—Permanent; control, a rocky riffle 200 feet below gage.

Discharge measurements.—At high stages made from the bridge. At extreme low stages by wading at the riffle below the bridge.

Diversions and inflow.—A slough connecting Lost River with Klamath River joins Lost River 5 miles below the Olene station and Klamath River 2 miles below Lake Ewauna. Through this slough it is proposed to divert part of the waters from Lost River into Klamath River, and thus reclaim lands bordering Tule Lake. At present, however, the slough has been artificially closed and the flow has been shut off for several years. Before it was diked no water flowed except during high water, the direction depending upon whether Klamath or Lost River was the higher. There is a small amount of inflow below Olene. One spring was measured April 14, 1908, giving a discharge of 2.9 second-feet, and during the irrigating season there is probably some waste water from irrigation. Nuss Lake is situated half a mile from the left bank of Lost River and 1 mile below Olene. It has no surface outlet except at flood time, but it is possible that a little water passes underground from this lake to the river during the summer months.

Accuracy.—The conditions at this station are favorable for good results.

Cooperation.—Station maintained by the United States Reclamation Service since May, 1909.

Discharge measurements of Lost River at Olene, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 28	L. Moser	7.43	2,240
28	do	7.35	2,100
Apr. 17	do	5.51	565

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Daily gage height, in feet, of Lost River at Olene, Oreg., for 1911.

[A. T. Wilson, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.60	4.62	4.55	7.70	5.45	4.58	4.50	4.45	4.56	4.52	4.54	4.54
2	4.58	4.62	4.54	7.70	5.08	4.57	4.50	4.46	4.52	4.52	4.52	4.54
3	4.58	4.62	4.54	7.60	4.94	4.57	4.50	4.45	4.50	4.52	4.52	4.54
4	4.56	4.62	4.56	7.10	4.92	4.57	4.50	4.45	4.50	4.52	4.52	4.54
5	4.55	4.65	4.64	6.70	4.90	4.57	4.50	4.45	4.50	4.52	4.52	4.54
6	4.55	4.77	4.82	6.50	4.88	4.57	4.50	4.45	4.50	4.52	4.52	4.53
7	4.55	4.88	5.27	7.20	4.87	4.56	4.50	4.45	4.50	4.52	4.52	4.53
8	4.55	4.89	5.85	7.20	4.88	4.56	4.50	4.45	4.51	4.52	4.52	4.53
9	4.54	4.68	5.60	6.60	4.88	4.58	4.50	4.45	4.51	4.52	4.52	4.53
10	4.54	4.70	5.70	6.30	4.85	4.60	4.48	4.45	4.51	4.52	4.52	4.53
11	4.55	4.70	5.70	6.20	4.82	4.60	4.47	4.45	4.51	4.52	4.52	4.53
12	4.55	4.70	5.55	5.80	4.78	4.61	4.44	4.45	4.51	4.52	4.52	4.53
13	4.55	4.70	5.55	5.65	4.77	4.62	4.43	4.45	4.51	4.52	4.52	4.53
14	4.55	4.72	5.55	5.60	4.76	4.61	4.43	4.43	4.51	4.52	4.52	4.53
15	4.55	4.74	5.65	5.55	4.74	4.60	4.43	4.43	4.51	4.52	4.53	4.53
16	4.55	4.77	5.75	5.48	4.70	4.60	4.44	4.43	4.51	4.52	4.54	5.53
17	4.54	4.80	5.70	5.48	4.69	4.60	4.44	4.43	4.51	4.52	4.54	4.53
18	4.54	4.72	5.90	5.60	4.69	4.40	4.44	4.43	4.51	4.52	4.54	4.53
19	4.55	4.66	6.20	5.65	4.69	4.29	4.44	4.44	4.51	4.52	4.54	4.53
20	4.56	4.62	6.40	5.50	4.69	4.33	4.45	4.45	4.51	4.52	4.54	4.53
21	4.56	4.57	7.40	5.37	4.70	4.40	4.45	4.45	4.51	4.52	4.54	4.53
22	4.57	4.55	7.60	5.38	4.72	4.41	4.45	4.48	4.51	4.52	4.54	4.53
23	4.57	4.55	8.10	5.40	4.72	4.48	4.45	4.58	4.51	4.52	4.54	4.53
24	4.57	4.56	8.70	5.36	4.72	4.52	4.45	4.62	4.51	4.52	4.54	4.53
25	4.58	4.55	9.20	5.34	4.70	4.51	4.45	4.62	4.51	4.52	4.54	4.53
26	4.58	4.55	8.70	5.26	4.68	4.51	4.45	4.62	4.51	4.54	4.54	4.53
27	4.58	4.55	7.90	5.26	4.64	4.52	4.46	4.65	4.52	4.54	4.54	4.53
28	4.58	4.55	7.40	5.14	4.62	4.52	4.46	4.80	4.52	4.54	4.54	4.53
29	4.58	.....	7.60	5.12	4.61	4.52	4.47	4.96	4.52	4.54	4.54	4.53
30	4.59	.....	7.70	5.36	4.60	4.52	4.47	4.84	4.52	4.54	4.54	4.53
31	4.60	.....	7.60	.....	4.59	.....	4.47	4.60	.....	4.54	.....	4.53

Daily discharge, in second-feet, of Lost River at Olene, Oreg., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	126	131	114	2,200	508	121	102	91	116	107	112	112
2	121	131	112	2,200	287	119	102	93	107	107	107	112
3	121	131	112	2,110	227	119	102	91	102	107	107	112
4	116	131	116	1,710	220	119	102	91	102	107	107	112
5	114	139	136	1,400	212	119	102	91	102	107	107	112
6	114	172	186	1,250	206	119	102	91	102	107	107	109
7	114	206	392	1,790	202	116	102	91	102	107	107	109
8	114	209	775	1,790	206	116	102	91	104	107	107	109
9	112	147	605	1,320	206	121	102	91	104	107	107	109
10	112	152	670	1,100	196	126	98	91	104	107	107	109
11	114	152	670	1,020	186	126	95	91	104	107	107	109
12	114	152	572	740	174	129	89	91	104	107	107	109
13	114	152	572	638	172	131	87	91	104	107	107	109
14	114	158	572	605	169	129	87	87	104	107	107	109
15	114	163	638	572	163	126	87	87	104	107	109	109
16	114	172	705	527	152	126	89	87	104	107	112	109
17	112	180	670	527	149	126	89	87	104	107	112	109
18	112	158	810	605	149	80	89	87	104	107	112	109
19	114	142	1,020	638	149	58	89	89	104	107	112	109
20	116	131	1,180	540	149	66	91	91	104	107	112	109
21	116	119	1,950	456	152	80	91	91	104	107	112	109
22	119	114	2,110	462	158	82	91	98	104	107	112	109
23	119	114	2,540	475	158	98	91	121	104	107	112	109
24	119	116	3,040	449	158	107	91	131	104	107	112	109
25	121	114	3,480	436	152	104	91	131	104	107	112	109
26	121	114	3,040	386	147	104	91	131	104	112	112	109
27	121	114	2,360	386	136	107	93	139	107	112	112	109
28	121	114	1,950	318	131	107	93	180	107	112	112	109
29	121	.....	2,110	307	129	107	95	235	107	112	112	109
30	124	.....	2,200	449	126	107	95	193	107	112	112	109
31	126	.....	2,110	.....	124	.....	95	126	.....	112	.....	109

NOTE.—Daily discharge determined from a rating curve well defined between 80 and 3,000 second-feet.

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Monthly discharge of Lost River at Olene, Oreg., for 1911.

[Drainage area, 1,290 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	126	112	117	0.091	0.10	7,190	A.
February	209	114	144	.112	.12	8,000	A.
March	3,480	112	1,210	.938	1.08	74,400	A.
April	2,200	307	914	.709	.79	54,400	A.
May	508	124	182	.141	.16	11,200	A.
June	131	58	110	.085	.09	6,550	A.
July	102	87	94.4	.073	.08	5,800	A.
August	235	87	109	.084	.10	6,700	A.
September	116	102	105	.081	.09	6,250	A.
October	112	107	108	.084	.10	6,640	A.
November	112	107	110	.085	.09	6,550	A.
December	112	109	109	.084	.10	6,700	A.
The year	3,480	58	277	.215	2.90	200,000	

TULE LAKE NEAR MERRILL, OREG.

Location.—At J. F. Adams's ranch near the mouth of Lost River, in sec. 8, T. 41 S., R. 11 E.

Records available.—May 17, 1904, to December 31, 1911.

Gage.—Vertical staff fastened to a post driven in the lake bed. Elevation of zero of gage, 4,048.21 feet above sea level. When the station was established, the gage was referred to a bench mark on a juniper post near by. The bench mark at that time was 13.7 feet above the zero of the gage. On October 21, 1904, this elevation was verified. On May 11, 1907, the elevation of the same bench mark was found to be 12.87 feet above zero of the gage, and was independently verified on June 11, 1907, and again on November 27, 1908. It appears, therefore, that sometime between October, 1904, and May, 1907, gage was raised 0.83 foot. This was probably due to the action of ice in the lake, although nothing of this kind has been observed since that time. Just when it occurred it has been impossible to ascertain, and a graph of the heights has failed to reveal any critical points that would account for a sudden change. It is therefore likely that the gage was raised a little at a time during the winters of 1905–6 and 1906–7.

Accuracy.—Gage heights prior to May, 1907, should not be used for refined studies.

Cooperation.—This station has been maintained by the United States Reclamation Service since 1909.

Daily gage height, in feet, of Tule Lake near Merrill, Oreg., for 1911.

[J. Frank Adams, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1				7.9			7.6					
2									6.6			6.1
3						7.95						
4		7.2	7.25								6.1	
5								7.1				
6					8.2							
7	7.0									6.3		
8				8.25			7.5					
9									6.5			6.1
10						7.95						

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Daily gage height, in feet, of Tule Lake near Merrill, Oreg., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
11		7.2	7.3								6.1	
12								6.95				
13												
14	7.1									6.3		
15				8.5	8.1		7.45					
16									6.45			6.1
17						7.95						
18		7.2	7.4								6.1	
19								6.8				
20					8.02							
21	7.1									6.2		
22				8.65			7.35					
23									6.4			6.1
24						7.7						
25		7.2	7.55								6.1	
26								6.7				
27					7.95							
28	7.1									6.1		
29				8.5			7.25					
30									6.3			6.1
31												

NOTE.—Lake frozen over Jan. 21 to Feb. 25 and Dec. 10–31.

MILLER CREEK NEAR LORELLA, OREG.

Location.—At highway bridge at Langell Valley, 1 mile east of the Swingle ranch, 3 miles south of Lorella, Oreg., in sec. 7, T. 40 S., R. 14 E.

Records available.—August 10, 1904, to December, 1908; April 1, 1909, to December 31, 1911.

Drainage area.—270 square miles.

Gage.—Friez automatic; installed January 30, 1910. Gage was originally established August 10, 1904, in sec. 12, T. 39 S., R. 13 E., 9 miles northeast of Lorella, at the lower end of Horsefly Valley; removed to the present site, which includes 50 square miles of drainage area more than that of the upper site, April 1, 1909.

Channel.—Rocky; practically permanent.

Discharge measurements.—Made from bridge or by wading.

Diversions.—Station is just below the diversion dam of a small irrigation flume which carries about 1 second-foot of water.

Accuracy.—Records somewhat fragmentary up to time Friez gage was installed; estimates have been made for all periods of missing observations; determinations of total run-off fairly accurate.

Cooperation.—Station maintained by United States Reclamation Service since May, 1909.

Discharge measurements of Miller River near Lorella, Oreg., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Mar. 21	L. Moser	6.40	990
21	....do	6.65	1,080
29	....do	7.55	1,800
31	....do	6.65	1,080
31	....do	8.05	2,160
Apr. 6	....do	6.65	1,110
16	....do	4.90	334
May 3[a]	....do	3.90	88.5

[a] Made by wading.

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Daily gage height, in feet, of Miller Creek near Lorella, Oreg., for 1911.

[Friez Auto Gage, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	2.70	2.17	.....	7.70	3.95	2.96	2.70	2.27	2.25	2.60	2.80	.....
2	2.69	2.16	.....	7.20	3.87	2.90	2.68	2.27	2.30	.....	2.80	2.80
3	2.69	2.14	.....	6.30	3.85	2.91	2.65	2.29	2.30	.....	2.80	2.80
4	2.69	2.20	2.45	6.40	3.79	2.89	2.62	2.30	2.30	.....	2.80	2.80
5	.....	2.20	2.65	7.40	3.85	2.86	2.59	2.30	2.35	.....	2.81	2.80
6	.....	2.20	3.20	6.60	4.00	2.88	2.56	2.30	2.39	.....	2.82	2.81
7	2.55	2.20	3.00	6.20	3.90	3.00	2.54	2.30	2.39	2.68	2.83	2.82
8	2.49	.....	3.10	5.80	3.81	3.03	2.49	2.30	2.38	2.67	2.86	2.82
9	2.46	.....	3.20	5.70	3.75	3.03	2.44	2.30	2.40	2.68	2.97	2.90
10	2.42	.....	3.40	5.10	3.65	2.93	2.40	2.30	2.39	.....	2.97	2.90
11	2.40	2.20	3.35	5.20	3.55	2.84	2.40	2.35	2.38	.....	3.00	2.90
12	.....	2.20	3.35	.....	3.45	2.70	2.40	2.40	2.38	.....	3.00	2.90
13	.....	2.20	3.40	.....	3.36	2.62	2.40	2.43	2.38	.....	3.00	2.90
14	2.35	.....	3.50	.....	3.29	2.76	2.39	2.42	2.38	2.70	2.97	2.90
15	2.25	.....	3.55	4.86	3.23	2.65	2.40	2.38	2.38	.....	2.98	2.90
16	2.20	.....	3.80	5.30	3.20	2.65	2.40	2.32	2.40	.....	3.10	2.92
17	2.20	.....	4.10	5.30	3.30	2.77	2.39	2.30	2.42	.....	3.14	2.92
18	2.20	2.20	4.20	5.08	3.69	2.62	2.40	2.30	2.46	.....	3.07	2.93
19	2.20	2.20	4.09	4.75	3.76	2.56	2.40	2.30	2.49	.....	3.00	2.93
20	2.20	.....	4.60	4.78	3.65	2.52	2.38	2.30	2.49	.....	2.94	2.93
21	2.20	.....	5.20	4.85	3.50	2.50	2.38	2.30	2.50	2.80	2.90	2.94
22	.....	.....	6.20	4.84	3.34	2.52	2.30	2.30	2.51	.....	2.88	3.05
23	.....	.....	7.15	4.78	3.20	2.68	2.30	2.30	2.50	.....	2.88	3.40
24	.....	.....	7.40	4.60	3.00	2.69	2.30	2.30	2.50	.....	2.88	3.40
25	.....	.....	7.30	4.50	2.98	2.67	2.30	2.30	2.55	.....	2.80	3.40
26	.....	.....	6.95	4.39	.....	2.68	2.31	2.30	2.61	.....	2.80	3.40
27	.....	.....	7.30	4.38	2.99	2.69	2.30	2.28	2.61	.....	2.80	3.40
28	2.20	.....	7.50	4.39	2.91	2.67	2.30	2.27	2.60	.....	2.80	.....
29	2.20	.....	7.55	4.21	2.86	2.65	2.28	2.27	2.60	.....	2.80	.....
30	2.20	.....	7.70	4.05	2.87	2.65	2.28	2.26	2.60	.....	.....	.....
31	2.16	.....	7.90	.....	2.81	.....	2.27	2.25	.....	.....	.....	.....

NOTE.—Probably no material effect from ice at this station except perhaps late in December.

Daily discharge, in second-feet, of Miller Creek near Lorella, Oreg., for 1911.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.7	0.1	1.7	1,900	106	12	5.7	0.6	0.4	4.0	7.7	7.7
2	5.5	.1	1.8	1,480	95	10	5.4	.6	.7	4.0	7.7	7.7
3	5.5	.1	1.9	879	92	10	4.8	.6	.7	4.2	7.7	7.7
4	5.5	.2	2.0	938	85	9.9	4.3	.7	.7	4.4	7.7	7.7
5	5.0	.2	4.8	1,640	92	9.1	3.9	.7	1.1	4.8	7.9	7.7
6	4.0	.2	23	1,060	112	9.6	3.4	.7	1.4	5.0	8.2	7.9
7	3.3	.2	13	823	99	13	3.2	.7	1.4	5.4	8.4	8.2
8	2.5	.2	17	626	87	14	2.5	.7	1.3	5.2	9.1	8.2
9	2.2	.2	23	582	80	14	1.9	.7	1.5	5.4	12	10
10	1.7	.2	39	362	68	11	1.5	.7	1.4	5.4	12	10
11	1.5	.2	34	393	56	8.7	1.5	1.1	1.3	5.5	13	10
12	1.4	.2	34	370	44	5.7	1.5	1.5	1.3	5.6	13	10
13	1.2	.2	39	345	35	4.8	1.5	1.8	1.3	5.6	13	10
14	1.1	.2	50	320	29	6.9	1.4	1.7	1.3	5.7	12	10
15	.4	.2	56	296	25	4.8	1.5	1.3	1.3	6.0	12	10
16	.2	.2	86	426	23	4.8	1.5	.9	1.5	6.3	17	11
17	.2	.2	127	426	30	7.1	1.4	.7	1.7	6.6	19	11
18	.2	.2	144	356	73	4.3	1.5	.7	2.2	6.9	16	11
19	.2	.2	126	268	81	3.4	1.5	.7	2.5	7.2	13	11
20	.2	.3	231	275	68	2.9	1.3	.7	2.5	7.5	11	11
21	.2	.5	393	293	50	2.6	1.3	.7	2.6	7.7	10	11
22	.2	.6	823	290	34	2.9	.7	.7	2.7	7.7	9.6	15
23	.2	.9	1,440	275	23	5.4	.7	.7	2.6	7.7	9.6	39
24	.2	1.0	1,640	231	13	5.5	.7	.7	2.6	7.7	9.6	39
25	.2	1.2	1,560	207	12	5.2	.7	.7	3.3	7.7	7.7	39

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Daily discharge, in second-feet, of Miller Creek near Lorella, Oreg., for 1911—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26	0.2	1.3	1,300	182	12	5.4	0.8	0.7	4.2	7.7	7.7	39
27	.2	1.5	1,560	180	13	5.5	.7	.6	4.2	7.7	7.7	39
28	.2	1.6	1,720	182	10	5.2	.7	.6	4.0	7.7	7.7	39
29	.2	.....	1,770	146	9.1	4.8	.6	.6	4.0	7.7	7.7	34
30	.2	.....	1,900	120	9.4	4.8	.6	.5	4.0	7.7	7.7	28
31	.1	.....	2,070	.....	7.9	.....	.6	.4	.....	7.7	.....	23

NOTE.—Daily discharge determined from a well-defined rating curve except at extreme low stages. Discharge interpolated for days on which gage was not read. No correction made for possible effect from ice.

Monthly discharge of Miller Creek near Lorella, Oreg., for 1911.

[Drainage area, 270 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
January	5.7	0.1	1.60	0.0059	0.007	98	D.
February	1.6	.1	.44	.0016	.002	24	D.
March	2,070	1.7	556	2.06	2.38	34,200	A.
April	1,900	120	529	1.96	2.19	31,500	A.
May	112	7.9	50.8	.188	.22	3,120	C.
June	14	2.6	7.09	.026	.03	422	D.
July	5.7	.6	1.91	.0071	.01	117	D.
August	1.8	.4	.80	.0030	.003	49	D.
September	4.2	.4	2.06	.076	.08	123	D.
October	7.7	4.0	6.30	.023	.03	388	D.
November	19	7.7	10.4	.038	.04	619	D.
December	39	7.7	17.2	.064	.07	1,060	D.
The year	2,070	.1	99.1	.367	5.072	72,000	

SHASTA RIVER NEAR MONTAGUE, CAL.

Location.—At highway bridge in the N. ½ NE. ¼ sec. 33, T. 45 N., R. 6 W., 1¼ miles southwest of Montague. Little Shasta River enters 1 mile above and Yreka Creek 5½ miles below the station.

Records available.—August 24 to December 31, 1911.

Drainage area.—Not measured.

Gage.—In two sections; high-water gage painted on upstream caisson of bridge pier near right bank; vertical staff for low water on same pier.

Channel.—Small bowlders and gravel.

Discharge measurements.—Made from upstream side of bridge and by wading.

Diversions.—Water is diverted for irrigation and for use in power development above the station.

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Discharge measurements of Shasta River near Montague, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 24	Harry Barnes	2.80	102
Sept. 3	G. T. Peekema	2.75	126
Oct. 25	Harry Barnes	2.82	158

NOTE.—All measurements made by wading. Measurements of Aug. 24 and Oct. 25 by engineer of Irrigation Investigations, Department of Agriculture.

Daily gage height, in feet, of Shasta River near Montague, Cal., for 1911.

[D. S. Lucas, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	2.65	2.85	3.0	16	2.75	2.8	2.95	3.0
2	.....	2.7	2.85	3.0	17	2.8	2.8	2.95	3.0
3	2.75	2.7	2.9	3.0	18	2.8	2.8	3.0	3.0
4	2.75	2.7	2.9	3.0	19	2.8	2.8	2.95	3.0
5	2.8	2.7	2.9	3.0	20	2.8	2.8	3.0	3.0
6	2.8	2.7	2.9	3.0	21	2.8	2.8	2.95	2.95
7	2.75	2.7	2.9	3.0	22	2.8	2.8	2.95	3.0
8	2.75	2.7	2.9	3.0	23	2.8	2.8	3.0	3.0
9	2.75	2.8	2.9	3.0	24	2.7	2.8	3.0	3.0
10	2.8	2.85	2.9	3.0	25	2.7	2.8	3.0	3.0
11	2.8	2.8	2.95	3.0	26	2.75	2.85	3.0	3.0
12	2.8	2.8	2.95	3.0	27	2.75	2.85	3.0	3.0
13	2.8	2.8	2.95	3.0	28	2.6	2.85	3.0	3.0
14	2.8	2.8	2.95	3.0	29	2.6	2.85	3.0	2.95
15	2.75	2.8	2.95	3.0	30	2.6	2.85	3.0	2.95
					31	.....	2.85	.....	2.95

EAST FORK OF SCOTT RIVER NEAR CALLAHAN, CAL.

Location.—About 500 feet west of W. Schneider's ranch house, in sec. 18, T. 40 N., R. 7 W., in the Shasta National Forest, and about 6 miles east of Callahan.

Records available.—November 1, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a willow tree on left bank 30 feet above foot log.

Channel.—Gravel and bowlders and fairly permanent.

Discharge measurements.—Made from foot log below gage and by wading.

Accuracy.—Results are good for periods covered by gage heights.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of East Fork of Scott River near Callahan, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 10[a]	G. T. Peekema	3.80	85
May 30	.....do	3.92	121
Sept. 20	.....do	2.80	1.6

[a] Measurement made from foot log.

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Daily gage height, in feet, of East Fork of Scott River near Callahan, Cal., for 1911.

[F. P. Cunningham and W. L. Schneider, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.2	3.7	3.3	4.5	.....	.....	3.2	.....	.....	.....	2.0	.....
2	.....	.....	3.3	.....	.....	.....	.....	.....	.....	2.8	.....	.....
3	.....	.....	3.3	.....	3.8	.....	.....	.....	.....	.....	.....	3.0
4	.....	.....	3.4	.....	.....	4.2	.....	.....	.....	.....	.....	.....
5	.....	.....	3.6	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	.....	.....	4.85	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	.....	.....	4.3	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	.....	.....	4.0	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	.....	3.4	3.85	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	.....	3.5	3.8	3.8	3.9	4.1	3.1	.....	.....	.....	.....	.....
11	.....	3.5	3.8	.....	.....	.....	.....	.....	.....	.....	.....	.....
12	.....	.....	3.8	.....	.....	.....	.....	.....	.....	.....	.....	.....
13	.....	.....	3.8	3.5	.....	.....	.....	.....	.....	.....	.....	.....
14	.....	.....	3.8	.....	.....	.....	.....	.....	.....	.....	.....	.....
15	.....	.....	3.8	.....	.....	.....	.....	.....	.....	2.8	.....	.....
16	.....	.....	3.8	.....	4.0	3.9	.....	.....	.....	.....	2.9	.....
17	3.1	.....	3.85	.....	.....	.....	.....	.....	.....	.....	.....	.....
18	3.15	.....	3.9	.....	.....	.....	3.0	.....	.....	.....	.....	3.0
19	3.7	.....	4.0	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	3.6	.....	4.0	.....	4.0	3.7	.....	.....	2.8	.....	.....	.....
21	3.5	.....	.....	3.7	.....	.....	.....	.....	.....	.....	.....	.....
22	3.4	.....	.....	.....	.....	.....	2.9	.....	.....	.....	.....	.....
23	3.4	.....	.....	.....	.....	3..6	.....	.....	.....	.....	.....	.....
24	3.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
25	3.4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
26	3.4	.....	.....	3.9	.....	.....	2.8	.....	.....	.....	.....	.....
27	3.45	.....	.....	.....	4.1	3.4	.....	.....	.....	.....	.....	.....
28	3.4	3.3	4.2	.....	.....	.....	.....	.....	.....	.....	.....	.....
29	3.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	4.0	.....	.....	3.8	3.9	.....	.....	.....	.....	.....	2.9	.....
31	3.9	.....	.....	.....	4.1	.....	.....	.....	.....	2.0	.....	3.0

Daily discharge, in second-feet, of East Fork of Scott River near Callahan, Cal., for 1910–11.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1910.			1910.			1910.		
1	6	18	11	11	71	21	16	20
2	7	23	12	11	90	22	16	20
3	7	32	13	11	70	23	16	15
4	7	43	14	11	40	24	38	15
5	7	32	15	11	30	25	23	15
6	7	23	16	11	30	26	20	15
7	7	20	17	14	30	27	20	15
8	7	23	18	16	20	28	18	15
9	7	43	19	16	20	29	16	15
10	7	56	20	16	20	30	16	15
						31	.....	16

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Daily discharge, in second-feet, of East Fork of Scott River near Callahan, Cal., for 1910–11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	16	71	23	265	88	160	16				0	
2	16	71	23	245	88	170	16			2		
3	16	71	23	225	88	175	15					7
4	16	71	32	205	88	180	14					
5	16	71	56	185	88	175	14					
6	16	32	382	165	88	170	13					
7	16	32	205	145	108	170	13					
8	16	32	130	125	108	165	12					
9	11	32	98	105	108	160	11					
10	11	43	88	88	108	155	11					
11	11	43	88	73	112	147	11					
12	11	33	88	58	115	140	10					
13	11	33	88	43	119	132	10					
14	11	33	88	40	123	124	9					
15	11	33	88	40	126	116	8			2		
16	11	33	88	40	130	108	8				4	
17	11	33	98	45	130	99	7					
18	14	33	108	50	130	89	7					7
19	71	33	130	55	130	80	6					
20	56	33	130	60	130	71	6		2			
21	43	33	135	71	135	66	5					
22	32	33	140	78	140	61	4					
23	32	33	150	86	140	56	3					
24	32	33	155	93	145	50	3					
25	32	33	160	101	145	44	3					
26	32	33	170	108	150	38	2					
27	38	33	175	103	155	32						
28	32	23	180	98	140	28						
29	43		200	93	124	24						
30	130		220	88	108	20					4	
31	108		240		155					0		7

NOTE.—Daily discharge, 1910–11, determined from a rating curve well defined below 150 second-feet. Discharge interpolated or estimated for days when the gage was not read. These values are based on hydrograph comparisons with the discharge at other near-by stations and are very roughly approximate. They are published as a matter of record only and should be used with caution.

Monthly discharge of East Fork of Scott River near Callahan, Cal., for 1910–11.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Accuracy.
1910.			
November	13.2	786	D.
December	29.4	1,810	D.
1911.			
January	29.7	1,830	C.
February	40.0	2,220	D.
March	128	7,870	C.
April	106	6,310	C.
May	121	7,440	C.
June	107	6,370	C.
July	8.0	492	D.
August	2.0	123	D.
September	2.0	119	D.
October	1.4	86	D.
November	2.9	173	D.
December	7.0	430	D.
The year	46.2	33,500	

NOTE.—Mean monthly discharge estimated August to December, 1911.

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SCOTT RIVER NEAR SCOTT BAR, CAL.

Location.—At highway bridge 2½ miles west of Scott Bar, in the NW. ¼ sec. 6, T. 45 N., R. 10 W., and about one-half of a mile above junction with Klamath River.
Records available.—September 12 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to left abutment of bridge near upstream end.
Channel.—Bowlders and gravel.
Discharge measurements.—Made from highway bridge at gage or by wading.
Winter flow.—Some ice during December, 1911, but it is not believed that it affected the flow at the gage.
Diversions.—Some water is diverted for use in mining and irrigation above the station.

The following discharge measurement was made by G. T. Peekema:
September 13, 1911: Gage height, 1.48 feet; discharge, 85 second-feet.

Daily gage height, in feet, of Scott River near Scott Bar, Cal., for 1911.

[George A. Milne, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	1.5	1.6	1.7	16	1.5	1.6	1.9	1.7
2	.....	1.5	1.6	1.7	17	1.5	1.6	1.9	1.75
3	.....	1.5	1.6	1.7	18	1.5	1.6	1.9	1.75
4	.....	1.5	1.6	1.7	19	1.5	1.6	1.8	1.7
5	.....	1.5	1.6	1.75	20	1.5	1.6	1.8	1.7
6	.....	1.5	1.6	1.75	21	1.5	1.6	1.8	1.7
7	.....	1.5	1.6	1.75	22	1.5	1.55	1.8	1.7
8	.....	1.5	1.6	1.7	23	1.5	1.55	1.8	1.7
9	.....	1.5	1.6	1.7	24	1.4	1.55	1.8	1.7
10	.....	1.5	1.7	1.7	25	1.4	1.55	1.8	1.7
11	.....	1.5	1.7	1.7	26	1.4	1.7	1.8	1.7
12	1.5	1.5	1.7	1.7	27	1.5	1.7	1.7	1.7
13	1.5	1.5	1.7	1.7	28	1.5	1.7	1.7	1.7
14	1.5	1.7	1.7	1.7	29	1.5	1.6	1.7	1.7
15	1.5	1.6	2.3	1.7	30	1.5	1.6	1.7	1.7
					31	.....	1.6	.....	1.7

NOTE.—Shore ice during the latter part of December.

INDIAN CREEK NEAR HAPPY CAMP, CAL.

Location.—Above highway bridge at Roberts ranch, in the NW. ¼ sec. 22, T. 17 N., R. 7 E., Humboldt meridian, about 4 miles north of Happy Camp and the mouth of the creek in Klamath National Forest.
Records available.—September 8 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to alder tree on left bank, about 700 feet above bridge.
Channel.—Small bowlders and gravel.
Discharge measurements.—Made from bridge below gage and by wading.
Diversions.—The Reeve Davis Consolidated Mining Co.'s ditch diverts water above the station and returns it below the station; other small ditches take water for use in mining.
Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

The following discharge measurement was made by G. T. Peekema by wading 400 feet below the gage:
September 8, 1911: Gage height, 2.58 feet; discharge, 39 second-feet.

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Daily gage height, in feet, of Indian Creek near Happy Camp, Cal., for 1911.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	2.55	.....	2.7	16	2.6	2.6	3.6	.....
2	.....	2.5	.....	.....	17	2.6	2.6	3.3	2.8
3	.....	.....	.....	2.6	18	2.6	.....	.....	.....
4	.....	2.6	.....	.....	19	2.55	2.6	.....	.....
5	.....	2.6	.....	.....	20	.....	2.55	.....	2.7
6	.....	2.6	2.5	3.6	21	2.5	2.5	.....	.....
7	.....	2.5	.....	.....	22	2.5	.....	3.0	2.7
8	2.6	2.7	.....	.....	23	2.5	2.5	.....	.....
9	2.6	2.6	2.95	2.9	24	2.45	.....	.....	2.8
10	2.6	2.6	2.8	.....	25	2.6	2.5	.....	.....
11	2.6	.....	.....	2.8	26	2.6	.....	3.0	2.7
12	2.7	2.6	.....	2.7	27	2.6	2.55	.....	.....
13	2.6	2.65	.....	2.7	28	2.6	2.55	3.0	2.8
14	2.6	2.7	3.0	2.7	29	2.6	.....	.....	.....
15	2.6	.....	4.4	2.7	30	2.55	2.55	2.8	2.7
					31	.....	.....	.....	.....

REEVE DAVIS CONSOLIDATED MINING CO.'S DITCH NEAR HAPPY CAMP, CAL.

Location.—In flume, in the SE. ¼ sec. 16, T. 17 N., R. 7 E., Humboldt meridian, about 5 miles north of Happy Camp.

Records available.—September 8 to December 31, 1911.

Gage.—Vertical staff fastened to right side of flume.

Discharge measurements.—Made from foot bridge at gage.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

The following discharge measurement was made by G. T. Peekema:
September 8, 1911: Gage height, 0.73 foot; discharge, 9.8 second-feet.

Daily gage height, in feet, of Reeve Davis Consolidated Mining Co.'s ditch near Happy Camp, Cal., for 1911.

Day.	Sept.	Oct.	Day.	Sept.	Oct.	Day.	Sept.	Oct.
1	.....	0.75	11	0.75	0.80	21	0.72	0.70
2	.....	.....	12	.80	.....	22	.....	.....
3	.....	.80	13	.85	.85	23	.70	.70
4	.....	.....	14	.80	.....	24	.....	.75
5	.....	.80	15	.....	.90	25	.75	.78
6	.....	.....	16	.....	.....	26	.....	.....
7	.....	.75	17	.75	.80	27	.72	.40
8	0.75	.....	18	.....	.....	28	.....	.75
9	.70	.90	19	.75	.90	29	.72	.....
10	.....	.....	20	.....	.....	30	.....	.....
						31	.....	.78

NOTE.—Gage destroyed and no records available November and December.

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SALMON RIVER AT SOMESBAR, CAL.

Location.—Below bridge, about 600 feet northeast of Somesbar post office, in SE. ¼ sec. 2, T. 13 N., R. 6 E., H. M., and about 1¼ miles above junction with Klamath River.

Records available.—September 17 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff in two sections on right bank about 900 feet below bridge.

Channel.—Bowlders and gravel.

Discharge measurements.—Made from bridge above gage or by wading.

The following measurement made by G. T. Peekema by wading one-half mile above gage:

September 18, 1911: Gage height, 3.55 feet; discharge, 193 second-feet.

Daily gage height, in feet, of Salmon River at Somesbar, Cal., for 1911.

[W. H. Hotelling, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	3.65	3.55	3.65	16	.....	3.75	4.7	3.8
2	.....	3.6	3.55	3.65	17	3.6	3.7	4.2	3.8
3	.....	3.6	3.5	3.65	18	3.55	3.65	3.9	3.8
4	.....	3.7	3.5	3.65	19	3.55	3.65	3.9	3.85
5	.....	3.65	3.5	3.7	20	3.5	3.6	3.9	3.8
6	.....	3.5	3.5	4.0	21	3.5	3.6	3.9	3.9
7	.....	3.5	3.5	4.0	22	3.5	3.6	3.85	3.9
8	.....	3.5	3.55	3.9	23	3.5	3.55	3.8	3.9
9	.....	3.8	3.8	3.9	24	3.5	3.55	3.8	3.9
10	.....	3.8	4.0	3.8	25	3.5	3.55	3.7	3.9
11	.....	3.75	3.8	3.8	26	3.55	3.55	3.7	3.9
12	.....	3.7	3.8	3.75	27	3.65	3.6	3.7	4.0
13	.....	3.65	3.8	3.7	28	3.6	3.6	3.7	4.2
14	.....	3.85	3.9	3.7	29	3.6	3.6	3.7	4.2
15	.....	3.85	5.0	3.7	30	3.6	3.6	3.65	4.0
					31	.....	3.6	.....	3.9

TRINITY RIVER NEAR TRINITY CENTER, CAL.

Location.—Below highway bridge, in the NE. ¼ sec. 16, T. 36 N., R. 7 W., in the Shasta National Forest, and 1½ miles southeast of Trinity Center. Coffee Creek enters 6 miles above, Hatchet Creek 1¾ miles above, East Fork three-fourths mile below, and Swift Creek 1¼ miles below the station.

Records available.—December 15, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff on right bank 650 feet below bridge. August 20, 1911, a low-water section was installed 400 feet below bridge to read same as original gage.

Channel.—Gravel; will shift during high water.

Discharge measurements.—Made from downstream side of bridge above gage and by wading.

Diversions.—Water is diverted from North Fork of Swift Creek for placer mining at Trinity Center. This water enters Trinity River above the station.

Accuracy.—Results are considered good except during the periods when there are no gage heights.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

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Discharge measurements of Trinity River near Trinity Center, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec. ft.*
April 6[a]	G. T. Peekema	5.05	2,010
May 19[a]	do	4.77	1,550
Aug. 20[b]	do	2.68	134
Oct. 2[c]	H. J. Tompkins	2.62	122

[a] Made from bridge 500 feet above gage.
[b] Made by wading 50 feet below old gage.
[c] Made by wading 350 feet above gage.

Daily gage height, in feet, of Trinity River near Trinity Center, Cal., for 1911.

[Fred Hansen and Ray W. Doney, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.0								2.45			
2		4.3								2.62		2.61
3	2.8		3.4			4.9						
4											2.61	
5	2.9	3.8						2.85				
6			4.4	5.05			3.7			2.60		
7	2.78	3.7										
8												
9	2.85		4.4			5.1						
10	2.95	3.6					3.5					
11								2.75	2.55			
12	2.9		4.5									
13		3.7					3.4					
14	3.05								2.60			2.68
15			4.2									
16	3.2	3.5				4.85						
17			4.4							2.60		
18	3.25											
19		3.3	4.55		4.8	4.7						
20					4.75			2.68				
21							3.2					
22	4.0	3.4	5.15									
23						4.25						
24			5.35								2.61	
25	3.8	3.4				4.0						2.70
26					4.9	4.05						2.60
27			4.9						2.65	2.61		
28	3.8	3.5					3.0					
29						3.9		2.50				2.70
30			5.1		4.85							
31	4.5											

Daily discharge, in second-feet, of Trinity River near Trinity Center, Cal., for 1910–11.

Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.
1910.		1910.		1910.		1910.		1910.		1910.	
1		6		11		16	383	21	330	26	261
2		7		12		17	365	22	330	27	250
3		8		13		18	348	23	330	28	240
4		9		14		19	330	24	307	29	221
5		10		15	482	20	330	25	284	30	202
										31	202

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Daily discharge, in second-feet, of Trinity River near Trinity Center, Cal., for 1910–11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	240	1,170	480	2,300	1,430	1,730	745	210	89	122	121	118
2	204	1,120	460	2,300	1,450	1,740	725	205	89	121	120	118
3	168	980	440	2,200	1,470	1,760	695	200	89	120	119	118
4	185	850	450	2,100	1,480	1,800	675	190	89	118	118	118
5	202	710	600	2,000	1,490	1,840	655	185	89	117	118	118
6	182	670	1,220	1,940	1,500	1,880	635	180	98	116	118	150
7	162	635	1,220	1,800	1,460	1,920	605	175	106	115	118	170
8	174	615	1,220	1,650	1,430	1,960	570	170	106	114	118	165
9	185	585	1,220	1,550	1,400	2,000	530	165	106	122	118	160
10	221	565	1,250	1,400	1,380	1,960	500	160	106	130	130	155
11	212	585	1,290	1,300	1,370	1,920	480	154	106	130	130	150
12	202	615	1,320	1,200	1,370	1,870	460	154	109	130	130	145
13	232	635	1,220	1,100	1,370	1,830	440	154	113	135	130	140
14	261	590	1,130	1,050	1,390	1,780	425	154	116	150	130	135
15	296	545	1,030	1,000	1,430	1,740	410	154	116	135	130	140
16	330	500	1,120	980	1,480	1,700	395	135	116	120	170	145
17	343	460	1,220	980	1,530	1,650	385	135	116	116	150	155
18	356	422	1,300	980	1,600	1,590	375	135	116	114	120	155
19	400	383	1,380	980	1,650	1,540	360	135	116	112	120	155
20	400	402	1,600	1,000	1,600	1,430	345	135	110	110	120	155
21	500	420	1,840	1,050	1,650	1,310	330	135	110	110	120	148
22	865	440	2 060	1,100	1,700	1,190	320	135	110	110	118	140
23	815	440	2,190	1,200	1,750	1,080	310	135	110	110	118	140
24	760	440	2,320	1,450	1,800	970	290	135	110	110	118	140
25	710	440	2,140	1,650	1,780	865	280	96	110	110	118	140
26	710	460	1,950	1,900	1,760	905	260	96	140	112	118	116
27	710	480	1,760	1,880	1,740	865	250	96	128	118	118	120
28	710	500	1,800	1,500	1,730	825	240	96	127	135	118	128
29	800	.....	1,800	1,400	1,720	785	235	96	125	130	118	140
30	950	.....	2,000	1,400	1,700	765	225	94	124	125	118	160
31	1,320	.....	2,200	.....	1,720	.....	220	91	.....	122	.....	170

NOTE.—Daily discharge 1910–11 determined from a well-defined rating curve. Discharge interpolated or estimated for days when the gage was not read. These values are based on hydrograph comparisons with the discharge at other near-by stations and are very roughly approximate. They are published as a matter of record only and should be used with caution.

Monthly discharge of Trinity River near Trinity Center, Cal., for 1910–11.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet.)	Accuracy.
1910.			
December 15–31	305	10,300	B.
1911.			
January	445	27,400	B.
February	595	33,000	B.
March	1,390	85,500	B.
April	1,480	88,100	C.
May	1,560	95,900	C.
June	1,510	89,800	C.
July	431	26,500	C.
August	145	8,920	C.
September	110	6,550	C.
October	121	7,440	C.
November	124	7,380	C.
December	142	8,730	C.
The year	670	485,000	

TRINITY RIVER AT LEWISTON, CAL.

Location.—At highway bridge at Lewiston, in the NE. ¼ sec. 19, T. 33 N., R. 8 W., and about 9 miles below Stewarts Fork. Indian Creek enters 6 miles below the station.

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Records available.—August 28 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff in two sections on left bank at bridge.
Channel.—Small bowlders and gravel; fairly permanent.
Discharge measurements.—Made from bridge at gage and by wading.
Diversions.—Water is diverted for use for irrigation, placer mining, and power development above station.
Accuracy.—Results are good.

Discharge measurements of Trinity River at Lewiston, Cal., in 1910–11.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
1910.			
Dec. 19[a]	H. D. McGlashan	3.62	782
1911.			
Mar. 21[a]	G. T. Peekema	6.38	4,330
May 18[a]	do	6.18	3,540
Aug. 28[b]	do	2.31	162
Sept. 28[c]	H. J. Tompkins	2.50	183

[a] Made from downstream side of bridge 25 feet below gage.
[b] Made by wading 1,500 feet below gage.
[c] Made by wading 300 feet above gage.

Daily gage height, in feet, and discharge, in second-feet, of Trinity River at Lewiston, Cal., for 1911.

[Wendell W. Phillips, observer.]

Day.	August.		September.		October.		November.		December.	
	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
1			2.28	144	2.43	178	2.47	188	2.44	180
2			2.30	148	2.45	182	2.47	188	2.44	180
3			2.29	146	2.49	192	2.45	182	2.48	190
4			2.30	148	2.45	182	2.46	185	2.49	192
5			2.40	170	2.45	182	2.45	182	2.48	190
6			2.32	152	2.44	180	2.44	180	2.68	253
7			2.34	157	2.41	172	2.49	192	2.78	288
8			2.34	157	2.40	170	2.49	192	2.71	264
9			2.34	157	2.58	219	2.50	195	2.62	232
10			2.35	159	2.59	222	2.49	192	2.65	242
11			2.39	168	2.53	204	2.59	222	2.59	222
12			2.36	161	2.51	198	2.52	201	2.53	204
13			2.38	166	2.51	198	2.53	204	2.51	198
14			2.48	190	2.71	264	2.55	210	2.49	192
15			2.39	168	2.61	228	2.53	204	2.51	198
16			2.36	161	2.52	201	2.82	303	2.53	204
17			2.35	159	2.52	201	2.80	295	2.59	222
18			2.40	170	2.50	195	2.55	210	2.56	213
19			2.35	159	2.51	198	2.58	219	2.54	207
20			2.33	155	2.45	182	2.59	222	2.53	204
21			2.32	152	2.42	175	2.60	225	2.53	204
22			2.32	152	2.41	172	2.58	219	2.49	192
23			2.32	152	2.44	180	2.57	216	2.51	198
24			2.31	150	2.44	180	2.59	222	2.51	198
25			2.32	152	2.46	185	2.58	219	2.49	192
26			2.53	204	2.48	190	2.59	222	2.50	195
27			2.49	192	2.59	222	2.58	219	2.50	195
28	2.30	148	2.49	192	2.61	228	2.54	207	2.55	210
29	2.30	148	2.46	185	2.58	219	2.54	207	2.64	239
30	2.29	146	2.46	185	2.52	201	2.48	190	2.71	264
31	2.29	146			2.47	188			2.75	278

NOTE.—Daily discharge determined from a fairly well defined rating curve.

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Monthly discharge of Trinity River at Lewiston, Cal., for 1911.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
September	204	144	164	9,760	B.
October	264	170	196	12,100	B.
November	303	180	210	12,500	B.
December	288	180	214	13,200	B.

TRINITY RIVER NEAR CHINA FLAT, CAL.

Location.—At suspension footbridge in sec. 15, T. 6 N., R. 5 E., Humboldt meridian, about 2 miles above junction with South Fork, and 8 miles above China Flat.

Records available.—October 11 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff in three sections bolted to rock ledge on left bank, 40 feet above bridge.

Channel.—Bowlders and gravel partly covered with silt—the débris of placer mining.

Discharge measurements.—Made from bridge below gage.

Diversions.—A small amount of water is diverted above the station for use in irrigation, power development, and placer mining.

The following discharge measurement was made by E. O. Christiansen:
December 31, 1911: Gage height, 5.0 feet; discharge, 588 second-feet.

Daily gage height, in feet, of Trinity River near China Flat, Cal., for 1911.

[Nels Anderburg, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	4.80	5.00	11	.....	5.12	5.10	21	4.85	5.20	5.15
2	.....	4.80	4.95	12	4.90	5.00	5.08	22	4.82	5.20	5.00
3	.....	4.80	4.95	13	4.90	5.00	5.00	23	4.80	5.12	5.00
4	.....	4.80	4.95	14	4.90	5.00	5.00	24	4.78	5.02	5.08
5	.....	4.78	4.95	15	5.00	5.38	5.05	25	4.78	5.00	5.00
6	.....	4.78	5.10	16	5.00	5.90	5.20	26	4.78	5.00	4.98
7	.....	4.78	5.30	17	4.94	5.68	5.20	27	4.80	5.00	5.20
8	.....	4.78	5.40	18	4.90	5.45	5.20	28	4.80	5.00	5.25
9	.....	4.80	5.30	19	4.90	5.30	5.10	29	4.85	5.00	5.15
10	.....	5.22	5.15	20	4.85	5.28	5.08	30	4.85	5.00	5.10
								31	4.82	.....	5.00

TRINITY RIVER AT HOOPA, CAL.

Location.—At Hoopa Indian Agency, in the NW. ¼ sec. 25, T. 8 N., R. 4 E., Humboldt meridian, about 1 mile above Hoopa Ferry, and about 11 miles above the junction with Klamath River.

Records available.—September 3 to December 31, 1911.

Drainage area.—Not measured.

Gage.—Staff in three sections on left bank 800 feet above mouth of Supply Creek.

Channel.—Sand and gravel; appears permanent.

Discharge measurements.—Made from ferry 1 mile below gage. As Supply Creek enters between gage and ferry, it is necessary to deduct discharge of this stream from measurements made at ferry to ascertain flow at gage.

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Discharge measurements of Trinity River at Hoopa, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 8	E. O. Christiansen	4.70	492
Dec. 30	.....do	5.30	812

NOTE.—Measurements were made ¼ and 1½ miles, respectively, below the gage and below mouth of Supply Creek. This creek was measured and discharge deducted to give discharge past gage. See miscellaneous measurements for discharge of Supply Creek.

Daily gage height, in feet, of Trinity River at Hoopa, Cal., for 1911.

[James W. Carroll and Julius Marshall, observers.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	4.65	4.71	4.92	16	4.58	4.98	6.22	5.11
2	.....	4.62	4.70	4.90	17	4.55	4.88	5.92	5.38
3	4.40	4.68	4.70	4.90	18	4.51	4.82	5.68	5.26
4	4.44	4.72	4.70	4.92	19	4.49	4.80	5.60	5.20
5	4.49	4.74	4.70	5.08	20	4.49	4.76	5.35	5.20
6	4.50	4.70	4.70	5.28	21	4.48	4.71	5.19	5.12
7	4.52	4.70	4.70	5.38	22	4.46	4.70	5.19	5.00
8	4.54	4.69	4.71	5.28	23	4.44	4.70	5.12	5.11
9	4.52	4.75	4.82	5.20	24	4.42	4.70	5.05	5.18
10	4.50	4.85	5.32	5.16	25	4.49	4.70	5.00	5.06
11	4.51	4.91	5.30	5.04	26	4.60	4.70	5.00	5.05
12	4.56	4.89	5.12	5.02	27	4.65	4.70	5.00	5.40
13	4.60	4.84	5.18	5.00	28	4.70	4.72	4.98	5.46
14	4.62	4.91	5.15	5.00	29	4.69	4.78	4.95	5.35
15	4.61	4.98	5.90	5.00	30	4.66	4.74	4.95	5.30
					31	.....	4.72	.....	5.26

COFFEE CREEK AT COFFEE, CAL.

Location.—At private highway bridge at Coffee, in the NW. ¼ sec. 4, T. 37 N., R. 8 W., in the Shasta National Forest, 5 miles above the junction with Trinity River. Boulder Creek enters 400 feet above and Little Boulder Creek 1¼ miles below the station.

Records available.—December 16, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened near upstream end of bridge pier near right bank.

Channel.—Gravel and bowlders; appears permanent.

Discharge measurements.—Made from downstream side of bridge at gage and by wading.

Artificial control.—From April to July, inclusive, and occasionally throughout the remainder of the year two dams with automatic or "self-shooting" gates are operated about 10 miles above the station. The Nash mine operates a dam having a working capacity of about 125 acre-feet. The Holland mine, on the East Fork, operates a dam having a working capacity of about 40 acre-feet. At the beginning of the season, in April, these dams fill and "shoot" about once an hour; at the end of the season, in July, once in 20 or 24 hours. During high water these "floods" are hardly perceptible, but late in the season their effect is pronounced. Gage readings are made only when the flow is normal.

Accuracy.—The gage-height record, on account of the operation of the self-shooting dam, is subject to some error. Otherwise the results are good.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

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Discharge measurements of Coffee Creek at Coffee, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
May 20[a]	G. T. Peckema	5.20	739
Aug. 18[b]	....do	3.54	62
Oct. 3[c]	H. J. Tompkins	3.40	41

[a] Last part of measurement made during flow from one of the "shooters."
[b] Made by wading 900 feet below gage.
[c] Made by wading 25 feet below gage.

Daily gage height, in feet, of Coffee Creek at Coffee, Cal. for 1911.

[F. H. Williams, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.75	4.40	4.00	5.5	5.5	5.8	4.9	3.8	3.35	3.42	3.48	3.37
2	3.80	4.30	4.10	5.4	5.5	5.9	4.9	3.75	3.35	3.42	3.48	3.38
3	3.80	4.20	4.10	5.4	5.6	5.9	4.8	3.7	3.35	4.00	3.50	3.38
4	3.75	4.10	4.05	5.4	5.6	5.5	4.7	3.7	3.35	3.42	3.50	3.40
5	3.73	4.10	4.15	5.4	5.6	5.5	4.65	3.65	3.35	3.42	3.50	3.40
6	3.72	4.00	4.70	5.3	5.6	5.5	4.6	3.6	3.35	3.41	3.52	3.40
7	3.75	3.95	4.60	5.4	5.5	5.55	4.6	3.6	3.37	3.42	3.52	3.40
8	3.75	3.90	4.50	5.3	5.5	5.4	4.55	3.6	3.37	3.42	3.52	3.40
9	3.78	3.93	4.30	5.3	5.4	5.6	4.55	3.55	3.38	3.42	3.52	3.42
10	3.73	3.95	4.25	5.2	5.5	5.6	4.5	3.55	3.38	3.42	3.52	3.42
11	3.70	3.97	4.20	.....	5.5	5.7	4.5	3.55	3.38	3.42	3.52	3.45
12	3.68	4.00	4.15	5.0	5.4	5.6	4.5	3.55	3.38	3.42	3.55	3.45
13	3.67	4.00	4.15	4.9	5.4	5.7	4.45	3.55	3.38	3.42	3.55	3.45
14	3.65	4.00	4.20	4.9	5.4	5.6	4.4	3.55	3.38	3.42	3.58	3.45
15	3.64	3.97	4.20	4.9	5.3	5.8	4.4	3.55	3.38	3.42	3.58	3.45
16	3.63	3.95	4.30	4.9	5.3	5.8	4.35	3.55	3.38	3.42	3.60	3.45
17	3.65	3.93	4.45	5.1	5.3	5.5	4.35	3.50	3.39	3.42	3.58	3.45
18	3.70	3.93	4.50	5.1	5.2	5.5	4.3	3.50	3.39	3.43	3.55	3.45
19	3.85	3.92	4.60	5.1	5.3	5.7	4.3	3.50	3.40	3.43	3.50	3.47
20	3.85	3.91	4.66	5.2	5.25	5.6	4.25	3.50	3.40	3.44	3.50	3.47
21	3.82	3.92	4.80	5.2	5.3	5.5	4.2	3.48	3.40	3.44	3.48	3.47
22	3.80	3.95	4.90	5.2	5.4	5.4	4.2	3.48	3.42	3.44	3.48	3.48
23	3.80	3.96	4.95	5.4	5.5	5.2	4.1	3.48	3.42	3.44	3.45	3.48
24	3.80	4.00	5.00	5.6	5.6	5.2	4.05	3.47	3.42	3.44	3.42	.....
25	3.85	4.00	4.95	5.6	5.5	5.1	4.05	3.47	3.42	3.45	3.40	.....
26	3.87	4.07	5.00	5.8	5.5	5.05	4.0	3.46	3.42	3.45	3.38	3.50
27	3.90	4.05	5.00	5.5	5.5	5.1	4.0	3.45	3.42	3.45	3.38	3.50
28	3.90	4.00	5.00	5.5	5.6	5.05	3.95	3.40	3.42	3.46	3.35	3.50
29	3.98	.....	4.95	5.5	5.6	5.05	3.9	3.40	3.42	3.46	3.35	3.50
30	4.20	.....	5.05	5.6	5.7	5.0	3.9	3.38	3.42	3.48	3.35	3.50
31	4.60	.....	5.30	.....	5.8	.....	3.85	3.35	.....	3.48	.....	3.50

NOTE.—Gage heights affected by action of dams (see description). Gage height Oct. 3 too high, account of discharge from self-shooting dam.

Daily discharge, in second-feet, of Coffee Creek at Coffee, Cal., for 1910–11.

Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.
1910.		1910.		1910.		1910.		1910.		1910.	
1	.....	6	.....	11	.....	16	180	21	111	26	104
2	.....	7	.....	12	.....	17	174	22	107	27	100
3	.....	8	.....	13	.....	18	174	23	106	28	97
4	.....	9	.....	14	.....	19	133	24	106	29	93
5	.....	10	.....	15	.....	20	115	25	104	30	90
										31	86

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Daily discharge, in second-feet, of Coffee Creek at Coffee, Cal., for 1910–11—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	86	258	133	1,000	1,000	1,290	510	93	40	46	52	41
2	93	222	159	910	1,000	1,390	510	86	40	46	52	42
3	93	189	159	910	1,100	1,390	445	78	40	46	54	42
4	86	159	146	910	1,100	1,000	390	78	40	46	54	44
5	82	159	174	910	1,100	1,000	365	72	40	46	54	44
6	81	133	390	820	1,100	1,000	340	65	40	45	56	44
7	86	122	340	910	1,000	1,050	340	65	41	46	56	44
8	86	111	297	820	1,000	910	318	65	41	46	56	44
9	90	118	222	820	910	1,100	318	60	42	46	56	46
10	82	122	206	735	1,000	1,100	297	60	42	46	56	46
11	78	126	189	658	1,000	1,190	297	60	42	46	56	49
12	75	133	174	580	910	1,100	297	60	42	46	60	49
13	74	133	174	510	910	1,190	278	60	42	46	60	49
14	72	133	189	510	910	1,100	258	60	42	46	63	49
15	70	126	189	510	820	1,290	258	60	42	46	63	49
16	69	122	222	510	820	1,290	240	60	42	46	65	49
17	72	118	278	655	820	1,000	240	54	43	46	63	49
18	78	118	297	655	735	1,000	222	54	43	47	60	49
19	102	115	340	655	820	1,190	222	54	44	47	54	51
20	102	113	370	735	778	1,100	205	54	44	48	54	51
21	97	115	445	735	820	1,000	189	52	44	48	52	51
22	93	122	510	735	910	910	189	52	46	48	52	52
23	93	124	545	910	1,000	735	159	52	46	48	49	52
24	93	133	580	1,100	1,100	735	146	51	46	48	46	53
25	102	133	545	1,100	1,000	655	146	51	46	49	44	53
26	106	151	580	1,290	1,000	618	133	50	46	49	42	54
27	111	146	580	1,000	1,000	655	133	49	46	49	42	54
28	111	133	580	1,000	1,100	618	122	44	46	50	40	54
29	129	.....	545	1,000	1,100	618	111	44	46	50	40	54
30	189	.....	618	1,100	1,190	580	111	42	46	52	40	54
31	340	.....	820	.....	1,290	.....	102	40	.....	52	.....	54

NOTE.—Daily discharge determined from a well-defined rating curve. Discharge interpolated Apr. 11, Oct. 3, and Dec. 24–25.

Monthly discharge of Coffee Creek at Coffee, Cal., for 1910–11.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910.					
December 16–31	180	86	118	3,750	B.
1911.					
January	340	69	101	6,210	B.
February	258	111	139	7,720	B.
March	820	133	355	21,800	B.
April	1,290	510	823	49,000	B.
May	1,290	735	979	60,200	B.
June	1,390	580	993	59,100	B.
July	510	102	255	15,700	B.
August	93	40	58.9	3,620	B.
September	46	40	43.0	2,560	B.
October	52	45	47.3	2,910	B.
November	65	40	53.0	3,150	B.
December	54	41	48.9	3,010	B.
The year	1,390	40	324	235,000	

EAST FORK OF TRINITY RIVER NEAR TRINITY CENTER, CAL.

Location.—At highway bridge 2¼ miles southeast of Trinity Center, in the SW. ¼ sec. 15, T. 36 N., R. 7 W., in the Shasta National Forest, one-fourth mile above junction with Trinity River.

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Records available.—December 15, 1910, to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff on downstream end of left abutment of bridge.
Channel.—Gravel and small bowlders; appears permanent. The section at the bridge is poor for measurements at low stages because of ponded water.
Discharge measurements.—Made from downstream side of bridge or by wading.
Diversions.—About 400 acres are irrigated from this stream. The principal diversion is the Trinity Farm & Cattle Co.'s canal, which heads about 4 miles above the station. Some water is also used for mining.
Accuracy.—Gage record incomplete; otherwise record is good.
Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of East Fork of Trinity River near Trinity Center, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 5	G. T. Peekema	6.25	1,160
May 19	do	5.55	701
Aug. 20[a]	do	3.44	6.7
Oct. 2[b]	H. J. Tompkins	3.55	12

[a] Made by wading 100 feet above gage. [b] Made by wading 200 feet below gage.

Daily gage height, in feet, of East Fork of Trinity River near Trinity Center, Cal., for 1911.

[Fred Hansen and R. W. Doney, observers.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.0	6.3							3.4			
2										3.55		3.6
3	4.1		5.7			5.7						
4								3.5			3.61	
5	4.05	5.8		6.25								
6			5.6		5.95		4.1			3.6		
7	4.0	5.75			5.9							
8					5.8							
9	4.05		5.4		5.6	5.4						
10	4.08	5.5					4.05					
11								3.45	3.5			
12	3.95		5.3									
13		5.7					3.95					
14	4.15								3.5			3.61
15			5.25		5.6	5.2						
16	4.2	5.4										
17	4.3		5.5							3.6		
18												
19		5.3	5.65		5.55	4.8						
20					5.5			3.44				
21							3.8	3.4				
22	4.2	5.0	5.9									
23						4.6						
24		5.4	6.2								3.6	
25	4.3											
26					5.8	4.45						
27		5.55	5.8						3.6	3.62		
28	4.9						3.7	3.4				
29				5.7		4.3						
30					5.8							
31	6.4		6.1									

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Daily discharge, in second-feet, of East Fork of Trinity River near Trinity Center, Cal., for 1910–11.

Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.
1910.		1910.		1910.		1910.		1910.		1910.	
1		6		11		16	194	21	68	26	40
2		7		12		17	145	22	64	27	40
3		8		13		18	117	23	60	28	40
4		9		14		19	89	24	53	29	43
5		10		15	243	20	78	25	47	30	46
										31	40

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1911.												
1	40	1,270	715	1,200	830	810	79	11	6	11	14	13
2	46	1,160	745	1,300	855	790	73	10	6	11	14	13
3	52	1,060	770	1,200	880	770	68	9	6	12	14	13
4	49	950	720	1,200	905	735	62	9	6	12	14	13
5	46	845	680	1,220	935	700	57	9	6	12	15	13
6	43	826	630	1,170	965	665	52	9	8	13	15	13
7	40	808	610	1,080	925	635	50	9	9	13	15	13
8	43	750	585	1,000	845	600	49	8	9	13	15	14
9	46	690	565	940	700	565	48	8	9	13	15	14
10	50	630	545	870	700	545	46	8	9	13	15	14
11	43	680	525	800	700	525	43	8	9	13	15	14
12	36	720	505	750	700	505	39	8	9	13	15	14
13	48	770	496	690	700	490	36	8	9	13	15	14
14	60	700	487	640	700	470	34	8	9	13	15	14
15	64	630	478	600	700	450	33	8	9	13	15	14
16	68	565	705	590	690	400	31	7	9	13	15	14
17	89	545	630	580	680	350	30	7	9	13	15	14
18	85	525	680	580	675	305	29	7	9	13	15	14
19	81	505	735	600	665	255	27	7	9	13	15	14
20	76	450	795	620	630	235	26	7	9	13	15	14
21	72	400	865	640	700	220	24	6	13	13	15	15
22	68	345	925	670	760	200	23	6	13	13	15	15
23	75	455	1,050	730	830	180	22	6	13	14	15	15
24	82	565	1,180	800	900	163	21	6	13	14	13	15
25	89	600	1,070	900	870	147	21	6	13	14	13	15
26	160	630	960	1,000	845	130	20	6	13	14	13	15
27	230	665	845	850	845	116	19	6	13	14	13	15
28	300	690	910	780	845	103	18	6	13	14	13	15
29	500	.....	970	770	845	89	16	6	12	14	13	15
30	800	.....	1,030	800	845	84	14	6	12	14	13	15
31	1,360	.....	1,090	.....	825	.....	12	6	.....	14	.....	15

NOTE.—Daily discharge 1910-11 determined from a well-defined rating curve. Discharge interpolated or estimated for days when the gage was not read. These values are based on hydrograph comparisons with the discharge at other nearby stations and are very roughly approximate. They are published as a matter of record only and should be used with caution.

Monthly discharge of East Fork of Trinity River near Trinity Center, Cal., for 1910–11.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Accuracy.
1910.			
December 15–31	82.8	2,790	B.
1911.			
January	156	9,590	C.
February	694	38,500	C.
March	758	46,600	C.
April	852	50,700	D.
May	790	48,600	C.
June	408	24,300	C.
July	36.2	2,230	C.
August	7.5	461	C.
September	9.7	577	C.
October	13.1	806	C.
November	14.4	857	C.
December	14.1	867	C.
The year	309	224,000	

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SWIFT CREEK NEAR TRINITY CENTER, CAL.

Location.—One-fourth mile above junction with North Fork of Swift Creek in E. ½ sec. 13, T. 36 N., R. 8 W., in the Shasta National Forest, about 2½ miles southwest of Trinity Center.

Records available.—December 17, 1910, to December 31, 1911.

Drainage area.—Not measured.

Gage.—Vertical staff fastened to a cedar tree on left bank 100 feet below foot log. August 19, 1911, a low-water section was installed at foot log to read same as original gage but at different datum.

Channel.—Bowlders; rough; probably permanent.

Discharge measurements.—Made from foot log or by wading.

Accuracy.—Individual measurements are subject to considerable error as the bed of the stream is rough. Rating curve averages all measurements and will give fair results. Gage-height record is incomplete.

Cooperation.—Gage-height record and discharge measurements furnished by United States Forest Service.

Discharge measurements of Swift Creek near Trinity Center, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Apr. 6[a]	G. T. Peekema	2.59	297
May 19[a]	do	2.52	281
Aug. 19[b]	do	[d] 1.66	23
Oct. 1[c]	H. J. Tompkins	[e] 1.50	16

[a] Made from foot log. Section poor.
[b] Made by wading 1,000 feet above gage.
[c] Made by wading 200 feet above new low-water section set Aug. 19.
[d] Both gages read same.
[e] Gage at footlog.

Daily gage height, in feet, of Swift Creek near Trinity Center, Cal., for 1911.

[Fred Hansen and R. W. Doney, observers.]

Day.	Jan.	Feb.	Mar	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1	1.6									1.5	
1											
3	1.5										
4	1.6				2.9						1.5
5					3.0			1.65			
6	1.45			2.6					1.55		
7											
8					2.8		2.1				
9	1.45					2.8				1.52	
10											
11											
12											
13									1.5		
14						3.0					
15	1.65										
16											
17									1.5		
18	1.78						2.05				
19					2.5			1.66			
20					2.5						
21											
22						2.45					
23									1.55		
24					2.9		1.8	1.6			
25											1.5
26											
27					2.7						
28										1.5	
29											
30							1.7				
31											

NOTE.—Gage heights Aug. 19 to Nov. 25, referred to gage at slightly different datum from those prior to Aug. 19.

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Daily discharge, in second-feet, of Swift Creek near Trinity Center, Cal., for 1910–11.

Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.	Day.	Dec.
1910.		1910.		1910.		1910.		1910.		1910.	
1		6		11		16		21	77	26	42
2		7		12		17	114	22	65	27	31
3		8		13		18	106	23	65	28	31
4		9		14		19	97	24	65	29	31
5		10		15		20	89	25	54	30	28
										31	25

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1911.								
1	19			350	450	610	172	28
2	14			340	450	670	164	27
3	10			330	450	670	156	26
4	19			330	460	350	148	25
5	13			320	520	350	140	25
6	7.5			307	480	370	133	25
7	7			300	440	400	125	25
8	7			300	405	300	117	25
9	7.5			280	370	405	116	25
10	10			270	400	460	114	25
11	13			240	400	520	113	25
12	16			210	380	520	111	25
13	19			180	360	520	110	26
14	22			180	350	520	109	26
15	25			180	330	600	107	26
16	31			180	310	600	106	26
17	37			210	300	450	104	26
18	43			240	280	450	103	26
19				250	263	550	94	26
20				250	263	450	85	
21				260	310	300	75	
22				270	360	242	65	
23				350	410	234	55	
24				420	460	226	46	
25				500	360	219	43	
26				600	360	211	40	
27				450	354	203	37	
28				450	400	195	35	
29				450	450	187	33	
30				450	510	179	31	
31					560		29	

NOTE.—Daily discharge 1910–11 based on a fairly well defined rating curve. Discharge interpolated or estimated for days when the gage was not read. These values are based on hydrograph comparisons with the discharge at other nearby stations and are very roughly approximate.

Monthly discharge of Swift Creek near Trinity Center, Cal., for 1910–11.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Accuracy.
1910.			
December 17–31	61.3	1,820	C.
1911.			
January	30	1,840	D.
February	45	2,500	D.
March	120	7,380	D.
April	315	18,700	B.
May	393	24,200	B.
June	399	23,700	B.
July	94.1	5,790	C.
August 1–19	25.7	969	C.
The period		85,100	

NOTE.—Mean discharge January, February, and March determined by comparison with discharge of Coffee Creek at Coffee. Mean discharge December, estimated.

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NORTH FORK OF TRINITY RIVER AT HELENA, CAL.

Location.—Just above highway bridge at Helena, in the sec. 28, T. 34 N., R. 11 W., about one-fourth mile above junction with Trinity River.
Records available.—August 23 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff fastened to an alder tree on left bank, 150 feet above bridge.
Channel.—Small bowlders and gravel.
Discharge measurements.—Made from bridge or by wading.

Discharge measurements of North Fork of Trinity River at Helena, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Aug. 23[a]	G. T. Peekema	1.40	38
Sept. 29[b]	H. J. Tompkins	1.40	31

[a] Made by wading. [b] Made by wading 500 feet below gage at wagon ford.

Daily gage height, in feet, of North Fork of Trinity River at Helena, Cal., for 1911.

[H. L. Knowles, observer.]

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	1.3	1.4	1.4	1.45	16	.....	1.35	1.5	1.55	1.50
2	.....	1.25	1.4	1.4	1.45	17	.....	1.35	1.45	2.00	1.50
3	.....	1.25	1.4	1.4	1.43	18	.....	1.35	1.4	1.80	1.50
4	.....	1.25	1.4	1.4	1.43	19	.....	1.35	1.4	1.65	1.50
5	.....	1.25	1.4	1.4	1.43	20	.....	1.35	1.4	1.50	1.50
6	.....	1.25	1.4	1.4	1.58	21	.....	1.35	1.4	1.48	1.50
7	.....	1.45	1.4	1.4	1.70	22	.....	1.35	1.4	1.45	1.50
8	.....	1.4	1.5	1.4	1.65	23	1.4	1.35	1.4	1.45	1.50
9	.....	1.4	1.5	1.4	1.60	24	1.4	1.35	1.4	1.45	1.50
10	.....	1.4	1.5	1.55	1.58	25	1.4	1.45	1.4	1.45	1.50
11	.....	1.4	1.5	1.48	1.55	26	1.4	1.45	1.4	1.45	1.50
12	.....	1.35	1.5	1.45	1.50	27	1.35	1.4	1.4	1.45	1.50
13	.....	1.35	1.55	1.45	1.50	28	1.35	1.4	1.4	1.45	1.55
14	.....	1.35	1.55	1.45	1.50	29	1.35	1.4	1.4	1.45	1.55
15	.....	1.35	1.55	1.45	1.50	30	1.3	1.4	1.4	1.45	1.50
						31	1.3	.....	1.4	.....	1.50

SOUTH FORK OF TRINITY RIVER NEAR CHINA FLAT, CAL.

Location.—At suspension footbridge, in sec. 17, T. 6 N., R. 5 E., Humboldt meridian, one-fourth mile above junction with Trinity River and about 6 miles above China Flat.
Records available.—October 12 to December 31, 1911.
Drainage area.—Not measured.
Gage.—Vertical staff bolted to rock ledge on right bank, 30 feet above bridge.
Channel.—Bowlders and gravel; appears permanent.
Discharge measurements.—Made from bridge below gage and by wading.

Discharge measurements of South Fork of Trinity River near China Flat, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 12[a]	E. O. Christiansen	3.84	102
Dec. 31[b]	.....do.....	4.16	202

[a] Made by wading 600 feet below gage. [b] Made by wading 400 feet below gage.

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Daily gage height, in feet, of South Fork of Trinity River near China Flat, Cal., for 1911.

[Nels Anderberg, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	.....	3.75	3.85	11	.....	4.10	3.92	21	3.78	4.00	4.00
2	.....	3.75	3.85	12	3.85	4.00	3.90	22	3.78	3.95	4.00
3	.....	3.75	3.85	13	3.85	4.00	3.90	23	3.75	3.92	4.00
4	.....	3.75	3.85	14	3.85	4.00	3.90	24	3.75	3.90	4.02
5	.....	3.75	3.85	15	3.85	4.12	3.88	25	3.75	3.90	4.00
6	.....	3.75	4.00	16	3.85	4.48	4.00	26	3.75	3.85	3.98
7	.....	3.75	4.08	17	3.85	4.30	4.15	27	3.75	3.85	4.20
8	.....	3.75	4.08	18	3.85	4.20	4.08	28	3.75	3.85	4.25
9	.....	3.80	4.00	19	3.80	4.00	4.02	29	3.75	3.85	4.20
10	.....	4.00	3.95	20	3.80	4.00	4.00	30	3.75	3.85	4.12
								31	3.75	.....	4.15

SMITH RIVER BASIN.

MIDDLE FORK OF SMITH RIVER NEAR CRESCENT CITY, CAL.

Location.—At highway bridge in the S. ½ sec. 20, T. 17 N., R. 2 E., Humboldt meridian, 800 feet above junction of North and Middle forks, one-eighth mile east of Gasquet and 14 miles northeast of Crescent City.

Records available.—September 8 to December 31, 1911.

Drainage area.—146 square miles.

Gage.—Chain gage attached to downstream guard rail of bridge. Length of chain, 47.61 feet.

Channel.—Bowlders and gravel; rough; section probably permanent.

Discharge measurements.—Made from bridge at gage and by wading.

Cooperation.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Middle Fork of Smith River near Crescent City, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 8	E. O. Christiansen	4.10	70
Dec. 5	.....do	4.49	131

NOTE.—Measurements made by wading 50 feet below gage.

Daily gage height, in feet, of Middle Fork of Smith River near Crescent City, Cal., for 1911.

[A. W. Lewis, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	4.02	4.40	16	4.12	.....	.....	.....
2	.....	.....	.....	4.40	17	4.10	.....	.....	.....
3	.....	4.10	.....	4.38	18	.....	.....	.....	.....
4	.....	.....	4.00	4.35	19	.....	.....	.....	.....
5	.....	4.15	.....	4.65	20	.....	.....	.....	.....
6	.....	.....	.....	5.28	21	.....	.....	.....	.....
7	.....	4.08	.....	5.08	22	.....	.....	.....	4.90
8	4.10	.....	.....	4.86	23	.....	4.05	.....	5.27
9	4.10	4.45	.....	4.73	24	.....	.....	.....	5.10
10	4.10	.....	5.00	4.66	25	4.08	4.05	.....	.....
11	4.10	.....	4.52	4.58	26	4.15	.....	.....	4.95
12	4.15	.....	.....	4.54	27	4.10	.....	.....	5.52
13	4.25	4.42	.....	4.51	28	4.10	4.05	.....	.....
14	4.12	4.50	.....	.....	29	4.08	.....	.....	.....
15	4.12	.....	8.60	.....	30	4.05	.....	4.42	.....
					31	.....	.....	.....	.....

NOTE.—Nov. 15, gage height estimated from marks on gage.

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NORTH FORK OF SMITH RIVER NEAR CRESCENT CITY, CAL.

Location.—Half a mile northeast of Gasquet, in the NE. ¼ sec. 20, T. 17 N., R. 2 E., Humboldt meridian, half a mile above junction of North and Middle forks and about 15 miles northeast of Crescent City.

Records available.—September 8 to December 31, 1911.

Drainage area.—81 square miles.

Gage.—Staff in four sections on left bank, installed December 3, 1911. Original gage, which was destroyed by high water on November 15, was located one-eighth mile below present gage. Original datum has not been maintained.

Channel.—Bowlders and gravel and is rough. Section is probably permanent.

Discharge measurements.—Made from car and cable at gage.

Cooperation.—Gage-height record furnished by United States Forest Service.

Discharge measurements of North Fork of Smith River near Crescent City, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 8[a]	E. O. Christiansen	3.60	73
Dec. 6[b]	.....do	12.82	1,440

[a] Made from foot log; reference to original gage.
[b] Made from cable; reference to new gage installed Dec. 3.

Daily gage height, in feet, of North Fork of Smith River near Crescent City, Cal., for 1911.

[A. W. Lewis, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	.....	3.50	.....	16	3.65	.....	.....	.....
2	.....	.....	.....	.....	17	3.58	.....	.....	.....
3	.....	3.60	.....	8.90	18	.....	.....	.....	.....
4	.....	.....	3.45	8.80	19	.....	.....	.....	.....
5	.....	3.62	.....	9.00	20	.....	.....	.....	.....
6	.....	.....	.....	12.90	21	.....	.....	.....	.....
7	.....	3.52	.....	12.00	22	.....	.....	.....	11.45
8	3.60	.....	.....	11.50	23	.....	3.52	.....	12.28
9	3.60	4.25	.....	11.20	24	.....	.....	.....	12.00
10	3.60	.....	6.10	11.00	25	3.52	3.52	.....	.....
11	3.62	.....	5.10	10.88	26	3.62	.....	.....	.....
12	3.69	.....	.....	10.75	27	3.68	.....	.....	12.55
13	3.75	4.30	.....	10.68	28	3.55	3.50	.....	.....
14	3.62	4.40	.....	.....	29	3.52	.....	.....	.....
15	3.62	.....	.....	.....	30	3.52	.....	.....	.....
					31	.....	.....	.....	.....

NOTE.—Readings Sept. 8 to Nov. 11 and Dec. 3 to 27 refer to gages at different datums (see description).

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SOUTH FORK OF SMITH RIVER NEAR CRESCENT CITY, CAL.

Location.—Just below highway bridge, in the SW. ¼ NE. ¼ sec. 10, T. 16 N., R. 1 E., Humboldt meridian, one-eighth mile above mouth and 9 miles northeast of Crescent City.

Records available.—September 9 to December 31, 1911.

Drainage area.—290 square miles.

Gage.—Staff in four sections on left bank 200 feet below bridge.

Channel.—Bowlders and gravel; may shift during high water.

Discharge measurements.—Made from car and cable 400 feet below gage and by wading.

Discharge measurements of South Fork of Smith River near Crescent City, Cal., in 1911.

Date.	Hydrographer.	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Sept. 9[a]	E. O. Christiansen	5.41	154
Dec. 13[b]	.....do	6.21	469

[a] Made by wading 300 feet below station. [b] Made from cable.

Daily gage height, in feet, of South Fork of Smith River near Crescent City, Cal., for 1911.

[Ruby Christensen, observer.]

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1	.....	5.45	5.50	6.00	16	5.40	5.74	5.42	6.66
2	.....	5.48	5.52	5.94	17	5.30	6.40	5.64	6.89
3	.....	5.45	5.58	6.00	18	5.40	6.30	6.85	6.84
4	.....	5.50	5.55	5.99	19	5.41	6.25	7.38	6.96
5	.....	5.50	5.54	6.10	20	5.42	6.20	7.35	7.00
6	.....	5.60	5.54	7.40	21	5.42	5.72	7.41	6.98
7	.....	5.61	5.51	7.20	22	5.40	5.71	7.40	7.00
8	.....	5.55	5.49	6.65	23	5.40	5.72	7.30	7.22
9	5.40	5.52	5.48	6.56	24	5.45	5.70	7.20	7.26
10	5.41	5.49	5.44	6.41	25	5.44	5.65	9.55	7.40
11	5.42	5.50	5.41	6.25	26	5.42	5.62	7.20	7.59
12	5.45	5.51	5.40	6.20	27	5.40	5.60	6.95	7.66
13	5.50	5.59	5.30	6.15	28	5.42	5.59	6.82	7.99
14	5.50	5.69	5.34	6.21	29	5.44	5.55	6.70	7.31
15	5.50	5.76	5.40	6.28	30	5.48	5.51	6.58	8.18
					31	.....	5.50	.....	7.95

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MISCELLANEOUS MEASUREMENTS.

The following miscellaneous measurements have been made of streams tributary to the Pacific Ocean in California during 1911:

Miscellaneous measurements in south Pacific Ocean drainage basins in 1911.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
May 8	Ellis flume	Diverts from Sweetwater River.	Flume, ½ mile below point of diversion, near Descanso, Cal.	.....	0.3
June 2	San Gabriel Water Co. canal.	Diverts from San Gabriel River.	Wading at intake, 100 feet above United States Geological Survey gaging station on San Gabriel River, near Azusa, Cal., NW. ¼ sec. 23, T. 1 N., R. 10 W.	.....	6.2
22	.....do.....	.....do.....	.....do.....	.....	15
Sept. 1	Simi Creek.....	Las Posas Creek...	Simi, Cal., Ventura County.....	.....	(a)
3	Piru Creek.....	Santa Clara River.	Wading 900 feet above Southern Pacific Railroad bridge at Piru, Ventura County.	.....	16
Oct. 27	Sisar Creek.....	Santa Paula Creek	Wading 100 feet above mouth, about 5½ miles north of Santa Paula, Cal., SW. ¼ NW. ¼ sec. 16, T. 4 N., R. 21 W.	.....	1.0
23	Matilija Creek.....	Ventura River....	Wading 300 feet above junction of North Fork of Matilija Creek, SW. ¼ NW. ¼ sec. 28, T. 5 N., R. 23 W.	.....	9.0
23	North Fork of Matilija Creek.	Matilija Creek.....	Wading 100 feet above mouth, SW. ¼ NW. ¼ sec. 28, T. 5 N., R. 23 W.	.....	20
23	Flume.....	Diverts from North Fork of Matilija Creek.	Intake, SW. ¼ NW. ¼ sec. 28, T. 5 N., R. 23 W.	.....	1.3
Sept. 9	Santa Maria River.	Pacific Ocean.....	Wagon bridge at Santa Maria, Cal, Santa Barbara County.	.....	(b)
14	Carmel River.....	.....do.....	½ mile above mouth, near Monterey, Cal., Monterey County.	.....	c3
10	Salinas River.....	Monterey Bay.....	Wagon bridge at San Miguel, Cal., San Luis Obispo County.	.....	c1
11	.....do.....	.....do.....	Wagon bridge at Bradley, Cal., Monterey County.	.....	c2
10	Estrello Creek.....	Salinas River.....	Mouth, near San Miguel, Cal., San Luis Obispo County.	.....	(b)
11	San Antonio River	.....do.....	1½ miles above mouth, near Bradley, Cal., Monterey County	.....	(b)
12	San Lorenzo River	.....do.....	Mathews damsite, 5 miles east of King City, Cal., 100 feet below old United States Geological Survey gaging station.	.....	9.1

a Water standing in pools. b Dry. c Estimated.

Miscellaneous measurements in San Francisco Bay drainage basins in 1910.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
1910.				*Feet.*	*Sec.-ft.*
June 3	Sonoma Creek.....	San Pablo Bay....	Wading at bridge, ½ mile north of Eldredge, Cal.	.....	4.8
July 9	.....do.....	.....do.....	.....do.....	.....	5.6
Aug. 16	.....do.....	.....do.....	.....do.....	.....	.9
June 3	.....do.....	.....do.....	Wading 200 feet above bridge, 1½ miles south of Sonoma, Cal.	.....	5.9
July 9	.....do.....	.....do.....	.....do.....	.....	2.4
Aug. 16	.....do.....	.....do.....	.....do.....	.....	7.4
June 3	Arroyo Seco.....	Sonoma Creek.....	Wading 50 feet above bridge, 2½ miles south of Sonoma, Cal.	.....	.2
May 24	Napa River.....	San Pablo Bay....	Wading under bridge, at Calistoga, Cal.	.....	2.0
July 12	.....do.....	.....do.....	.....do.....	.....	.3
Aug. 13	.....do.....	.....do.....	.....do.....	.....	.1

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Miscellaneous measurements in San Francisco Bay drainage basins in 1910—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
1910.				*Feet.*	*Sec.-ft.*
May 26	Napa River	San Pablo Bay	Wading 100 feet below bridge on road from Bale railroad station, 4 miles north of St. Helena, Cal.		5.1
July 13	do	do	do		1.5
Aug. 14	do	do	do		.4
May 26	do	do	Wading 75 feet below bridge 1 mile northeast of Helena, Cal.		5.5
July 13	do	do	do		1.4
Aug. 14	do	do	do		.4
May 27	do	do	Wading at bridge 1 mile east of Rutherford, Cal.		1.1
July 13	do	do	do		2.7
Aug. 14	do	do	do		1.4
1911.					
Aug. 28	do	do	Wading 600 feet below second bridge, 6 miles northwest of Napa, Cal.		2.7
1910.					
May 26	Lyman Creek	Napa River	Wading 30 feet below bridge, 3 miles north of St. Helena, Cal.		0.7
July 13	do	do	do		.4
Aug. 14	do	do	do		.2
May 26	Bell Creek	do	Wading 150 feet below bridge, 2 miles north of St. Helena, Cal.		.6
27	Conn Creek	do	Wading 75 feet below bridge on Skellenger ranch, 3 miles southeast of Rutherford, Cal.		.3
July 13	do	do	do		.0
May 27	Rector Creek	Conn Creek	Wading 200 feet above Frey dam, 3 miles northeast of Yountville, Cal.		1.3
July 13	do	do	do		.6
Aug. 15	do	do	do		.7
May 28	Dry Creek	Napa River	Wading 1,000 feet above second dam, 2 miles west of Oak Knoll, Cal.		4.0
July 14	do	do	do		.2
Aug. 15	do	do	do		.0
May 28	do	do	Wading 300 feet below bridge, ½ mile south of Trubody, Cal.		.2
June 2	Milliken Creek	do	Wading at bridge, 4 miles northeast of Napa, Cal.		.3
July 14	do	do	do		.2
May 28	do	do	Wading 600 feet below bridge, 2½ miles northeast of Napa, Cal.		.5
July 14	do	do	do		.1
Aug. 15	do	do	do		.1
May 28	North Branch of Napa River.	do	Wading 300 feet above stone bridge, 3 miles west of Napa, Cal.		1.0
July 14	do	do	do		.0

NOTE.—These measurements were made by United States Department of Agriculture, Irrigation Investigations. (Furnished by Frank Adams, irrigation manager, Berkeley, Cal.)

Miscellaneous measurements in San Joaquin River basin in 1911.

Tulare Lake basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Sept. 12	Powers ditch	Diverts from South Fork of Kern River.	At Warren Rankin ranch, near Onyx, above regular United States Geological Survey gaging station on South Fork of Kern River, NW. ¼ NW. ¼ sec. 24 T. 25 S., R. 35 E.		2.7
Nov. 16	do	do	At Warren Rankin ranch, near Onyx, above regular United States Geological Survey gaging station on South Fork of Kern River, NW. ¼ NW ¼ sec. 24 T. 25 S., R. 53 E.		1.1
Jan. 17	Posey Creek	Tulare Lake	Above Carver ditch		3.5

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Miscellaneous measurements in San Joaquin River basin in 1911—Continued.

Tulare Lake basin—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Jan. 19	White River.....	Tulare Lake.....	At White River, Cal., 3½ T. 24 S., R. 29 E.	.....	2.2
Mar. 8	.....do.....	.....do.....	.....do.....	.....	30
Jan. 25	Rancheria Creek...	Bear Creek.....	About 8 miles northeast of Daunt, Cal., near mouth, 300 feet below gage on Bear Creek.	.....	29
Mar. 14	.....do.....	.....do.....	.....do.....	.....	13
11	South Fork of Kaweah River.	Tulare Lake.....	Bridge below Three Rivers, Cal., SW. ¼ sec. 26 T. 17 S., R. 28 E.	.....	302
12	.....do.....	.....do.....	.....do.....	.....	221
May 19	.....do.....	.....do.....	.....do.....	.....	229
Sept. 18	.....do.....	.....do.....	Wading ½ mile above Maxon ranch, above all diversions, near Three Rivers, Cal., sec. 15, T. 18 S., R. 29 E.	.....	6.0
Nov. 23	Mehrten ditch.....	Diverts from South Fork of Kaweah River.	Near Three Rivers, Cal., sec. 15, T. 18 S., R. 29 E.	.....	.5
Sept. 16	Sugar Pine Company flume.	Diverts from Fresno River.[a]	Near gage on Fresno River, 9 miles from Raymond. NE. ¼ sec 15, T. 8 S., R. 20 E.	.....	7.2
Nov. 10	.....do.....	.....do.....	.....do.....	.....	10

[a] Also feeder from Big Creek, South Fork of Merced River drainage.

Main San Joaquin River and tributaries.

				Feet.	*Sec.-ft.*
July 24	Middle Fork of San Joaquin River.	San Joaquin River.	Meadow at Devil Postpile, Mount Lyell quadrangle.	.....	[a] 593
26	.....do.....	.....do.....	.....do.....	.....	
29	Shadow Creek.....	Middle Fork of San Joaquin River.	Outlet of Shadow Lake, Cal., NW. ¼ sec. 17, T. 3 S., R. 26 E.	.....	418 [b] 160
28	Minaret Creek.....	.....do.....	At meadow near mouth about 1½ miles north of Devil Postpile, Cal.	.....	60
28	Soda Meadow Creek.	.....do.....	Wading near mouth, about ½ mile north of Devil Postpile.	.....	6.9
30	King Creek.....	.....do.....	Wading just below Mammoth trail ford, ¼ mile south and 1 mile west of Devil Postpile bridge crossing on main trail from Jackass Meadow to Mammoth Pass.	.....	56
23	North Fork of San Joaquin River.	.....do.....	At Soda Spring, Mount Lyell quadrangle, wading at wagon trail crossing.	.....	594
31	Granite Creek.....	.....do.....	SW. ¼ sec. 5, T. 5 S., R. 25 E. Wading near mouth.	.....	117
31	Little Jackass Creek.	Granite Creek.....	NW. ¼ sec. 5, T. 5 S., R. 25 E	.....	11
15	Jackass Creek.....	San Joaquin River	Wading below ford on McCreary-Shuteye trail, NE. ¼ sec. 2, T 6 S., R. 24 E, Kaiser quadrangle.	.....	58
14	Chiquito Creek....	.....do.....	Wading at Big Shuteye trail ford, Browns Meadow, SW. ¼ sec. 29, T. 6 S., R. 24 E.	.....	190
13	Whisky Creek.....	North Fork.....	Wading above wagon bridge at Cascadel ranch, near North Fork, Cal., SE. ¼ sec. 16, T. 8 S., R. 23 E.	.....	12
13	Cascadel Creek....	Whisky Creek.....	Wading below gage of San Joaquin Light & Power Co. near Cascadel ranch, near North Fork, Cal., SE. ¼ sec. 16, T. 8 S., R. 23 E.	.....	1.4
16	Merced River.....	San Joaquin River.	Old United States Geological Survey gaging station at wagon bridge at Yosemite, Cal.	7.15	2,550
Aug. 18	.....do.....	.....do.....	Wading 500 feet above United States Geological Survey gage at Yosemite, Cal.	3.35	269

[a] Stream was divided into two channels, east channel measured, west channel estimated from measurement made July 26. East channel carried 268 second-feet July 24, and 189 second-feet July 26.
[b] Estimated.

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Miscellaneous measurements in San Joaquin River basin in 1911—Continued.

Main San Joaquin River and tributaries—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
July 16	Tenaya Creek.....	Merced River.....	Old United States Geological Survey gaging station at wagon bridge near Yosemite, Cal.	5.58	325
Aug. 19	.....do.....	.....do.....	Wading 500 feet above United States Geological Survey gage, near Yosemite, Cal.	.....	11
July 16	Yosemite Creek....	.....do.....	Old United States Geological Survey gaging station at wagon bridge, ½ mile from Yosemite, Cal.	8.38	227
Aug. 18	.....do.....	.....do.....	Wading about 200 feet above United States Geological Survey gage at Yosemite, Cal.	.....	12
22	South Fork of Merced River.	.....do.....	Wading above mouth of Big Creek, about ½ mile west of Wawona, Cal.	.....	27
22	Big Creek.....	South Fork of Merced River.	At mouth, about ½ mile west of Wawona, Cal.	.....	20
July 18	Tuolumne River..	San Joaquin River	Highway bridge in Tuolumne Meadows, Mount Lyell quadrangle.	.....	1,250
Aug. 28	South Fork of Tuolumne River.	Tuolumne River..	Wading just above sawmill at Sequoia, Cal.	[a].65	23
28	Middle Fork of Tuolumne River.	South Fork of Tuolumne River.	Wading ½ mile above junction with South Fork below new bridge on San Francisco road, ¾ mile north and ¾ mile east of Colfax Gate, Sonora quadrangle.	.....	9.5
Sept. 22	Mokelumne River[c]	San Joaquin River.	Wading 200 feet below Weather Bureau gage, above power house of Pacific Gas & Electric Co., at Electra, Cal.	.09	44
22	.....do.[b].....	.....do.....	Wading ½ mile below Pacific Gas & Electric Co.'s power house at Electra, Cal.	.....	253
Oct. 12	.....do.....	.....do.....	Wading 600 feet above power house of Pacific Gas & Electric Co. at Electra, Cal.	.16	51
13	.....do.....	.....do.....	Wading 200 feet below toll bridge on Mokelumne Hill to Jackson, Cal., 1 mile northwest of Mokelumne Hill, Cal.	.....	223
Sept. 23	North Fork of Mokelumne River.	Mokelumne River.	Wading 300 feet below highway bridge 1½ miles northwest of West Point, Cal.	.....	7.4
Oct. 10	Upper flume.....	Diverts from North Fork of Mokelumne River.	At gaging station of Pacific Gas & Electric Co., about 2½ miles northwest of West Point, Cal.	3.78	129
10	Lower flume.....	.....do.....	In flume opposite suspension footbridge about 2½ miles northwest of West Point, Cal.	.....	54
11	South Fork of Mokelumne River.	Mokelumne River.	Wading 300 feet below bridge 1 mile north of Railroad Flat, Cal. [c]	.....	16
Sept. 23	.....do.....	.....do.....	Foot log 200 feet below highway bridge about 2 miles northeast of Glencoe, Cal.	.....	31
Oct. 11	Licking Fork of Mokelumne River.	South Forth of Mokelumne River.	Wading 30 feet below bridge on West Point to Railroad Flat road 1½ miles north of Railroad Flat, Cal. [d]	.....	11
Sept. 23	Middle Fork of Mokelumne River.	.....do.....	Wading 100 feet below highway bridge 1½ miles south of West Point, Cal.	.....	9.3
Oct. 6	Dry Creek.....	Mokelumne River.	Wading 600 feet below mouth of Jackson Creek, 7 miles southwest of Ione, Cal.	.....	8.1
8	Sutter Creek.....	Dry Creek.....	At damsite about ½ mile below Volcano, Cal.	.....	3.5
8	.....do.....	.....do.....	.....do.....	.....	3.3
6	Jackson Creek.....	.....do.....	At mouth, 7 miles southwest of Ione, Cal.	.....	[e]

[a] Gage is ½ inch diameter iron bar, graduated; located on left bank close to a small bowlder and near a cedar tree with dead top, near sawmill.

[b] The difference in discharge above and below the power house, 209 second feet, is the amount of water in the power canal at Electra.

[c] Water surface 2.7 feet below top point of rock in front of 8-inch stump 10 feet below largest rock on left bank.

[d] Water surface 4.88 feet below 8d. nail in south bridge pier, middle of river.

[e] Dry.

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Miscellaneous measurements in San Joaquin River basin in 1911—Continued.

Main San Joaquin River and tributaries—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Aug. 13	Cosumnes River...	Mokelumne River.	Wading below North Fork of Cosumnes River at Huse Bridge, Cal.	.....	35
12	North Fork of Cosumnes River.	Cosumnes River...	At Bucks Bar, Cal.....	.....	25
13	South Fork of Cosumnes River.	.....do.....	Wading just above junction with North Fork of Cosumnes River at Huse Bridge, Cal.	.....	12
Oct. 12	Middle Fork of Cosumnes River.	South Fork of Cosumnes River.	At Bakers Ford, Placerville quadrangle.	.....	19

Miscellaneous measurements in Sacramento River basin in 1911.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Oct. 15	Sacramento River.	San Francisco Bay.	Downstream side of highway bridge of Colusa, Cal.	[a] 1.84	6,470
16	.....do.....	.....do.....	Downstream side of railroad bridge at Knights Landing, Grafton post office, Cal.	[b] .60	6,100
Dec. 19	.....do.....	.....do.....	.....do.....	[c] .86	6,450
Aug. 16	Pit River.....	Sacramento River.	Wading, 400 feet above highway bridge at Pitville, Cal., sec. 18, T. 37 N., R. 5 E.	.....	36
May 13	H. M. Wilcox ditch.	Diverts from Hat Creek.	Intake, Hat Creek, Cal., crossing of Hat Creek road.	.....	[d] 49.0
Aug. 15	.....do.....	.....do.....	Wading, 30 feet below head gates above Hawkins' ranch near Hat Creek, Cal.	.....	39.4
May 13	H. Morris ditch....	.....do.....	300 feet below intake at Hat Creek,	.....	[e] 12.2
	L. H. Sullivan et al., ditch.	.....do.....	.....do.....	.....	[e] 8.3
	Olive Opdyke ditch.	.....do.....	600 feet below intake, Hat Creek, Cal.	.....	[e] 5.0
	M. A. Reives ditch.	.....do.....	900 feet below intake, Hat Creek, Cal.	.....	[f] 12.0
	Anderson et al., ditch.	.....do.....	Intake, Hat Creek, Cal.....	.....	[g] 9.6
	Anderson et al., lateral.	.....	.....do.....	.....	[h] 7.4
	O. R. L. lateral to Anderson et al., ditch.	.....	Head gate, Hat Creek, Cal.....	.....	2.2
	P. M. Honn ditch..	.....do.....	.....	.....	[i] 4.8
Aug. 12	Nelson Creek.....	Pit River.....	Wading 400 feet above mouth and 80 feet below highway bridge ¾ mile above Henderson, Cal., sec. 31, T. 37 N., R. 1 E.	.....	30
11	Hatchet Creek.....	.....do.....	Lower road crossing, Montgomery Creek to Henderson, Cal., sec. 24, T. 35 N., R. 1 W.	.....	[k] 40
11	Roaring Creek.....	Hatchet Creek....	Lower road crossing, Montgomery Creek to Henderson, Cal., sec. 14, T. 35 N., R. 1 W.	.....	[k] 18
May 25	Squaw Creek.....	Pit River.....	Wading ½ mile below Winthrop, Cal.	[l] 5.00	270

[a] Weather Bureau gage.
[b] Southern Pacific Co.'s gage read 23.40 feet.
[c] Southern Pacific Co.'s gage read 23.60 feet.
[d] Very nearly ½ of flow immediately returns to creek; ½ used for irrigation eventually returns in several streams.
[e] No waste returns to Hat Creek above regular gaging station.
[f] About ⅔ of flow wastes back into creek.
[g] 7.0 second-feet returns to creek.
[h] About 2 second-feet wastes back into creek.
[i] Diversion from an old channel of Hat Creek; ⅔ of flow wastes back into this channel and returns to main creek.
[k] Estimated.
[l] Gage height observed on June 24, 1911, was 4.3 feet.

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Miscellaneous measurements in Sacramento River basin in 1911—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Sept. 29[a]	Cow Creek	Sacramento River.	Wading 300 feet below bridge, 1 mile east of Millville, Cal., sec. 14, T. 31 N., R 3 W.	.....	70
Aug. 18	North Fork of Cow Creek.	Cow Creek	Wading 150 feet above highway bridge, about 11 miles northeast of Millville, Cal., sec. 16, T. 32 N., R. 3 W.	.....	54
18	Canal, diverting from North Fork of Cow Creek.	.....	Road crossing 10 miles northeast of Millville, Cal., near Basin Hollow, sec. 20, T. 32 N., R. 1 W.	.....	12
10	Little Cow Creek	Cow Creek	Wading 6 feet below lower side of bridge, stage road crossing on road from Oak Run to Buzzards Roost, Cal., sec. 4, T. 33 N., R. 1 W.	(b)	7.0
11	Terry Lumber Co.'s flume.	(c)	½ mile above Buzzards Roost, Cal.	.....	19
Sept. 29	Bear Creek	Sacramento River.	Wading 50 feet below bridge, 2 miles north of Balls Ferry, sec. 15, T. 30 N., R 3 W.	.....	40
Oct. 12	Cottonwood Creek	.....do	Wading 7 miles above Cottonwood, Cal.	.....	28
Aug. 19	Battle Creek	.....	Wading just below new power house of Northern California Power Co., 5 miles southeast of Balls Ferry, Cal.	.....	352
22	Antelope Creek	Sacramento River.	Wading ¼ mile above dam of Red Bluff City water works, about 10 miles east of Red Bluff, Cal., sec. 1, T. 29 N., R. 3 W.	.....	50
Oct. 9	.....do	.....do	Wading 200 feet below old power dam near mouth of canyon, near Red Bluff, Cal.	.....	83
Aug. 24	Deer Creek	.....do	Wading 120 feet below sheep bridge near mouth of canyon, about 8 miles northeast of Vina, Cal., sec. 23, T. 25 N., R 1 W.	.....	156
Sept. 11	Indian Creek	North Fork of Feather River.	Wading about 1,000 feet above intake of Taylorsville mill race at Taylorsville, Cal.	.....	[d] 52
11[e]	Taylorsville mill race.	Diverts from Indian Creek.	Wading 500 feet below intake at Taylorsville, Cal.	.....	33
18[f]	South Fork of Feather River.	Middle Fork of Feather River.	Wading 75 feet below highway bridge at Enterprise, Cal., sec. 1, T. 19 N., R. 6 E.	.....	2.2
18	Palermo Land & Water Co. ditch.	Diverts from South Fork of Feather River.	In flume at Enterprise, Cal.	.....	37
Aug. 18	South Fork of Yuba River.	Yuba River	At Emigrant Gap, Cal.	.....	[g] 2
15	Bear River	.....	Below Pacific Gas & Electric Co.'s diverting dam, near Colfax, Cal.	.....	12
Sept. 28	.....do	.....	.....do	.....	18
Oct. 20	.....do	.....	.....do	.....	2.1
Sept. 28	Pacific Gas & Electric Co.'s canal.	Bear River	Made in flume of Pacific Gas & Electric Co., 600 feet below dam, near Colfax, Cal., sec. 22, T. 15 N., R. 9 E.	2.87	46
Oct. 29	Kelsey Creek	Clear Lake	Highway bridge at Kelseyville, Cal. (head of Cache Creek).	.....	[h]
30	Seigler Creek	Cache Creek	At mouth at Lower Lake, Cal.	.....	[g] ½

[a] Made by Irrigation Investigations, United States Department of Agriculture.
[b] Water surface 2.10 feet down from top of nail head near upstream end of bridge pier on left bank (nail projects ½ inch).
[c] Diverts water from Montgomery Creek into Little Cow Creek.
[d] Total flow available at Taylorsville.
[e] This ditch is now used to divert water for irrigation in Indian Valley.
[f] The measured flow of Palermo Land & Water Co. ditch, which diverts from South Fork of Feather River 1½ miles above the bridge should be added to give total normal flow. There is some small leakage through dam, some waste from ditch, and also some water enters from two small streams, nearly dry, between point of diversion and bridge.
[g] Estimated.
[h] Dry.

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Miscellaneous measurements in north Pacific Ocean drainage basins in 1910–11.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
1910.					
May 17[a]	Russian River	Pacific Ocean	Wading 200 feet above East Fork Russian River, 3 miles north of Ukiah, Cal.		19
July 5[a]	do	do	Wading 100 feet above East Fork of Russian River, 3 miles north of Ukiah, Cal.		2.8
May 16[a]	do	do	Wading 200 feet south of telephone crossing, 1 mile east of Ukiah, Cal.		96
1911.					
May 29[a]	do	do	do		229
Aug. 30[a]	do	do	Wading 200 feet below dridge, 3 miles southeast of Ukiah, Cal.		6
1910.					
May 18[a]	do	do	Wading 700 feet above bridge, ½ mile west of Hopland, Cal.		238
19[a]	do	do	Wading 100 feet south of south end of pile bulkhead, 1 mile north of Cloverdale, Cal.		289
1911.					
Aug. 29[a]	do	do	Wading at bridge, 4 miles north of Healdsburg, Cal.		17
1910.					
May 20[a]	do	do	Wading 1,000 below highway bridge, at Healdsburg, Cal.		348
17[a]	East Fork of Russian River.	Russian River	Wading 200 feet above mouth, 3 miles north of Ukiah, Cal.		207
July 5[a]	do	do	Wading 100 feet above mouth, 3 miles north of Ukiah, Cal.		22
1911.					
Nov. 2	Ackerman Creek	do	Wagon bridge near mouth, about 2 miles north of Ukiah, Cal.		(b)
2	Orr Creek	do	Wagon bridge near mouth, about ½ mile north of Ukiah, Cal.		(b)
Oct. 29	Pieta Creek	do	Near mouth, about 1 mile south of Pieta, Cal.		c 2
1910.					
May 25[a]	Kellogg Creek	do	Wading 100 feet below mouth of Yellowjacket Creek at Kellogg, Cal.		2.6
July 12[a]	do	do	do		.7
May 25[a]	Yellowjacket Creek	Kellogg Creek	Wading 50 feet above Chas. Foote's dam, 1 mile east of Kellogg, Cal.		2.7
Aug. 13[a]	do	do	do		.7
13[a]	Mill Creek	do	Wading 1 mile above mouth, 1 mile north of Kellogg, Cal.		.8
1911.					
Nov. 20	Honey Dew Creek	Mattole Creek	Wading at mouth, sec. 6, T. 3 S., R. 1 E., H. M.		13
21	Squaw Creek	do	Mouth, sec. 30, T. 2 S., R. 1 W., H. M.		c 2
22	North Fork of Mattole Creek.	do	Ford near mouth, sec. 4, T. 2 S., R. 2 W.		c 3
22	Davis Creek	Pacific Ocean	Road crossing near mouth, sec. 13, T. 1 S., R. 3 W.		c ½
22	Bear River	do	Near mouth, Capetown, Cal., sec. 13, T. 1 N., R. 3 W., H. M.		c 5
1905.					
Sept. 3[d]	South Eel River	Eel River	Just above Preston, Mendocino County, Cal.		5.5
1911.					
Nov. 4	Tomki Creek	South Eel River	Road crossing on road from Willits to Hearst, Cal., sec. 26, T. 19 N., R. 13 W.		(b)
5	Burger Creek	Eel River	Bridge on road between Laytonville and Covelo, Cal., sec. 10, T. 21 N., R. 14 W.		c ½
16	do	do	do		c 1
19	Redwood Creek	South Fork of Eel River.	Briceland, Cal., sec. 18, T. 4 S., R. 3 E.		c ½
Sept. 22	Healy Creek	Van Duzen River.	Near mouth, wagon bridge on road from Carlotta to Bridgeville, Cal.		c .1
Oct. 19	do	do	do		c .2
Sept. 22	Grizzly Creek	do	Near mouth, bridge on road from Carlotta to Bridgeville, Cal.		c ½
Oct. 19	do	do	do		c ½

[a] Made by United States Department of Agriculture, Irrigation Investigations.
[b] Dry.
[c] Estimated.
[d] Furnished by Snow Mountain Water & Power Co.

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Miscellaneous measurements in north Pacific Ocean drainage basins in 1910–11—Contd.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
1911.				*Feet.*	*Sec.-ft.*
Sept. 21[a]	Lawrence Creek	Yager Creek	500 feet below Booth Run, Cal.	.....	1.5
19[a]	Mad River	Pacific Ocean	Wading just below mouth of Bug Creek, sec. 9, T. 3 N., R. 4 E.	.....	4.6
4	Little River	....do....	Railroad bridge, about 5½ miles southeast of Trinidad, Cal., sec. 9, T. 7 N., R. 1 E.	.....	[b] 3
Nov. 29	....do....	....do....	Wagon bridge, about 3 miles southeast of Trinidad, Cal., sec. 6, T. 7 N., R. 1 E.	.....	[b] 2
Sept. 5	Maple Creek	Big Lagoon	Wagon bridge, sec. 20, T. 9 N., R. 1 E.	.....	[b] 1
Nov. 29	....do....	....do....	....do....	.....	[b] 1
Sept. 5	McDonald Creek	Stone Lagoon	Wagon bridge, sec. 29, T. 10 N., R. 1 E.	.....	[b] ½
4	Minor Creek	Redwood Creek	Mouth, sec. 28, T. 7 N., R. 3 E.	.....	[b] ½
Oct. 14	....do....	....do....	....do....	.....	[b] ¾
Sept. 5	Prairie Creek	....do....	Wagon bridge at Prairie, Cal., sec. 2, T. 11 N., R. 1 E.	.....	[c]
Nov. 29	....do....	....do....	....do....	.....	[b] 2
Aug. 22[d]	Shasta River	Klamath River	Wading 150 feet below Southern Pacific Railroad bridge, 2 miles south of Montague, Cal., sec. 33, T. 45 N., R. 6 W.	.....	111
21[d]	Little Shasta River.	Shasta River	Wading, 1½ miles northeast of Little Shasta, Cal., sec. 17, T. 45 N., R. 4 W.	.....	7.2
Sept. 3	Siskiyou Electric Co. ditch.	Diverts from Shasta River.	900 feet below diversion dam, 4 miles north of Yreka, Cal.	.....	107
Apr. 10	Scott River	Klamath River	Highway bridge, 1 mile below Callahan.	[e]	372
May 30	....do....	....do....	....do....	[f]	575
Sept. 20	....do....	....do....	....do....	[g]	17
Nov. 1[d]	....do....	....do....	Wading at bridge, 3 miles north of Callahan.	.....	14
Aug. 30[d]	....do....	....do....	Wading 150 feet above bridge, 7 miles west of Fort Jones, Cal., sec. 26, T. 44 N., R. 10 W.	.....	40
Sept. 8	Indian Creek	....do....	Highway bridge at Happy Camp, Cal., sec. 11, T. 16 N., R. 7 E.	[h]	[i] 52
Aug. 24	Trinity River	....do....	Wading ¼ mile above mouth of North Fork of Trinity River near Helena, Cal., sec. 33, T. 34 N., R. 11 W.	.....	220
20	Trinity Land & Cattle Co. ditch.	Diverts from East Fork of Trinity River.	About 450 feet above road crossing about 3 miles southeast of Trinity Center, Cal.	1.62	11
21	Stewarts Fork of Trinity River.	....do....	Wading ¼ mile above mouth, about 600 feet below mouth of Buckeye Creek and below a ditch diversion, 1½ miles south of Milnerville, Cal.	.....	32
Sept. 30	....do....	....do....	....do....	.....	33
29	Canyon Creek	....do....	Wading 600 feet above highway bridge about 1½ miles north of Junction City, Cal., sec. 36, T. 34 N., R. 11 W.	.....	6.8
30	Canyon Creek ditch.	Diverts from Canyon Creek.	Intake 500 feet above highway bridge, about 1½ miles north of Junction City, Cal.	.....	4.6
Aug. 25	Hay Fork of Trinity River.	South Fork of Trinity River.	Below junction with Salt Creek, sec. 10, T. 31 N., R. 12 W.	.....	3.4
25	Salt Creek	Hay Fork of Trinity River.	Mouth, sec. 10, T. 31 N., R. 12 W.	.....	.5
Oct. 7	Willow Creek	Trinity River	Wading 200 feet below bridge near mouth at China Flat, Cal., sec. 29, T. 7 N., R. 5 E.	[f]	7.3
Dec. 30	....do....	....do....	Wading 500 feet below bridge at China Flat, Cal.	[k]	36

[a] Made by R. L. Thomas, City Engineer of Eureka, Cal.
[b] Estimated.
[c] Dry.
[d] Made by United States Department of Agriculture, Irrigation Investigations.
[e] Water surface 13.78 feet below top of steel chord at second vertical from right abutment, upstream side.
[f] Water surface 13.37 feet below same reference point as used Apr. 10, 1911.
[g] Water surface 15.14 feet below reference point.
[h] Water surface 22.88 feet below small nail, upstream end of second floor beam from right abutment.
[i] About 8 second-feet diverted out of Indian Creek watershed for placer mine about ½ mile below Happy Camp on Klamath River.
[j] Water surface 2.00 feet below paint mark on rock under left nd of br dge.
[k] Water surface 1.64 feet below reference point established Oct. 7, 1911.

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MISCELLANEOUS MEASUREMENTS.

The following miscellaneous measurements have been made of streams tributary to the Pacific Ocean in California during 1911:

Miscellaneous measurements in south Pacific Ocean drainage basins in 1911.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
May 8	Ellis flume	Diverts from Sweetwater River.	Flume, ½ mile below point of diversion, near Descanso, Cal.	.....	0.3
June 2	San Gabriel Water Co. canal.	Diverts from San Gabriel River.	Wading at intake, 100 feet above United States Geological Survey gaging station on San Gabriel River, near Azusa, Cal., NW. ¼ sec. 23, T. 1 N., R. 10 W.	.....	6.2
22	do	do	do	.....	15
Sept. 1	Simi Creek	Las Posas Creek	Simi, Cal., Ventura County	.....	(a)
3	Piru Creek	Santa Clara River.	Wading 900 feet above Southern Pacific Railroad bridge at Piru, Ventura County.	.....	16
Oct. 27	Sisar Creek	Santa Paula Creek	Wading 100 feet above mouth, about 5½ miles north of Santa Paula, Cal., SW. ¼ NW. ¼ sec. 16, T. 4 N., R. 21 W.	.....	1.0
23	Matilija Creek	Ventura River	Wading 300 feet above junction of North Fork of Matilija Creek, SW. ¼ NW. ¼ sec. 28, T. 5 N., R. 23 W.	.....	9.0
23	North Fork of Matilija Creek.	Matilija Creek	Wading 100 feet above mouth, SW. ¼ NW. ¼ sec. 28, T. 5 N., R. 23 W.	.....	20
23	Flume	Diverts from North Fork of Matilija Creek.	Intake, SW. ¼ NW. ¼ sec. 28, T. 5 N., R. 23 W.	.....	1.3
Sept. 9	Santa Maria River.	Pacific Ocean	Wagon bridge at Santa Maria, Cal, Santa Barbara County.	.....	(b)
14	Carmel River	do	½ mile above mouth, near Monterey, Cal., Monterey County.	.....	c3
10	Salinas River	Monterey Bay	Wagon bridge at San Miguel, Cal., San Luis Obispo County.	.....	c1
11	do	do	Wagon bridge at Bradley, Cal., Monterey County.	.....	c2
10	Estrello Creek	Salinas River	Mouth, near San Miguel, Cal., San Luis Obispo County.	.....	(b)
11	San Antonio River	do	1½ miles above mouth, near Bradley, Cal., Monterey County	.....	(b)
12	San Lorenzo River	do	Mathews damsite, 5 miles east of King City, Cal., 100 feet below old United States Geological Survey gaging station.	.....	9.1

a Water standing in pools. b Dry. c Estimated.

Miscellaneous measurements in San Francisco Bay drainage basins in 1910.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
1910.				*Feet.*	*Sec.-ft.*
June 3	Sonoma Creek	San Pablo Bay	Wading at bridge, ½ mile north of Eldredge, Cal.	.....	4.8
July 9	do	do	do	.....	5.6
Aug. 16	do	do	do	.....	.9
June 3	do	do	Wading 200 feet above bridge, 1½ miles south of Sonoma, Cal.	.....	5.9
July 9	do	do	do	.....	2.4
Aug. 16	do	do	do	.....	7.4
June 3	Arroyo Seco	Sonoma Creek	Wading 50 feet above bridge, 2½ miles south of Sonoma, Cal.	.....	.2
May 24	Napa River	San Pablo Bay	Wading under bridge, at Calistoga, Cal.	.....	2.0
July 12	do	do	do	.....	.3
Aug. 13	do	do	do	.....	.1

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Miscellaneous measurements in San Francisco Bay drainage basins in 1910—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
1910. May 26	Napa River	San Pablo Bay	Wading 100 feet below bridge on road from Bale railroad station, 4 miles north of St. Helena, Cal.		5.1
July 13	do	do	do		1.5
Aug. 14	do	do	do		.4
May 26	do	do	Wading 75 feet below bridge 1 mile northeast of Helena, Cal.		5.5
July 13	do	do	do		1.4
Aug. 14	do	do	do		.4
May 27	do	do	Wading at bridge 1 mile east of Rutherford, Cal.		1.1
July 13	do	do	do		2.7
Aug. 14	do	do	do		1.4
1911. Aug. 28	do	do	Wading 600 feet below second bridge, 6 miles northwest of Napa, Cal.		2.7
1910. May 26	Lyman Creek	Napa River	Wading 30 feet below bridge, 3 miles north of St. Helena, Cal.		0.7
July 13	do	do	do		.4
Aug. 14	do	do	do		.2
May 26	Bell Creek	do	Wading 150 feet below bridge, 2 miles north of St. Helena, Cal.		.6
27	Conn Creek	do	Wading 75 feet below bridge on Skellenger ranch, 3 miles southeast of Rutherford, Cal.		.3
July 13	do	do	do		.0
May 27	Rector Creek	Conn Creek	Wading 200 feet above Frey dam, 3 miles northeast of Yountville, Cal.		1.3
July 13	do	do	do		.6
Aug. 15	do	do	do		.7
May 28	Dry Creek	Napa River	Wading 1,000 feet above second dam, 2 miles west of Oak Knoll, Cal.		4.0
July 14	do	do	do		.2
Aug. 15	do	do	do		.0
May 28	do	do	Wading 300 feet below bridge, ½ mile south of Trubody, Cal.		.2
June 2	Milliken Creek	do	Wading at bridge, 4 miles northeast of Napa, Cal.		.3
July 14	do	do	do		.2
May 28	do	do	Wading 600 feet below bridge, 2½ miles northeast of Napa, Cal.		.5
July 14	do	do	do		.1
Aug. 15	do	do	do		.1
May 28	North Branch of Napa River.	do	Wading 300 feet above stone bridge, 3 miles west of Napa, Cal.		1.0
July 14	do	do	do		.0

NOTE.—These measurements were made by United States Department of Agriculture, Irrigation Investigations. (Furnished by Frank Adams, irrigation manager, Berkeley, Cal.)

Miscellaneous measurements in San Joaquin River basin in 1911.

Tulare Lake basin.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Sept. 12	Powers ditch	Diverts from South Fork of Kern River.	At Warren Rankin ranch, near Onyx, above regular United States Geological Survey gaging station on South Fork of Kern River, NW. ¼ NW. ¼ sec. 24 T. 25 S., R. 35 E.		2.7
Nov. 16	do	do	At Warren Rankin ranch, near Onyx, above regular United States Geological Survey gaging station on South Fork of Kern River, NW. ¼ NW ¼ sec. 24 T. 25 S., R. 53 E.		1.1
Jan. 17	Posey Creek	Tulare Lake	Above Carver ditch		3.5

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Miscellaneous measurements in San Joaquin River basin in 1911—Continued.

Tulare Lake basin—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Jan. 19	White River.....	Tulare Lake.....	At White River, Cal., 3½ T. 24 S., R. 29 E.	.....	2.2
Mar. 8	.....do.....	.....do.....	.....do.....	.....	30
Jan. 25	Rancheria Creek...	Bear Creek.....	About 8 miles northeast of Daunt, Cal., near mouth, 300 feet below gage on Bear Creek.	.....	29
Mar. 14	.....do.....	.....do.....	.....do.....	.....	13
11	South Fork of Kaweah River.	Tulare Lake.....	Bridge below Three Rivers, Cal., SW. ¼ sec. 26 T. 17 S., R. 28 E.	.....	302
12	.....do.....	.....do.....	.....do.....	.....	221
May 19	.....do.....	.....do.....	.....do.....	.....	229
Sept. 18	.....do.....	.....do.....	Wading ½ mile above Maxon ranch, above all diversions, near Three Rivers, Cal., sec. 15, T. 18 S., R. 29 E.	.....	6.0
Nov. 23	Mehrten ditch.....	Diverts from South Fork of Kaweah River.	Near Three Rivers, Cal., sec. 15, T. 18 S., R. 29 E.	.....	.5
Sept. 16	Sugar Pine Company flume.	Diverts from Fresno River.[c]	Near gage on Fresno River, 9 miles from Raymond. NE. ¼ sec 15, T. 8 S., R. 20 E.	.....	7.2
Nov. 10	.....do.....	.....do.....	.....do.....	.....	10

[c] Also feeder from Big Creek, South Fork of Merced River drainage.

Main San Joaquin River and tributaries.

				Feet.	*Sec.-ft.*
July 24	Middle Fork of San Joaquin River.	San Joaquin River.	Meadow at Devil Postpile, Mount Lyell quadrangle.	.....	[a] 593
26	.....do.....	.....do.....	.....do.....	.....	
29	Shadow Creek.....	Middle Fork of San Joaquin River.	Outlet of Shadow Lake, Cal., NW. ¼ sec. 17, T. 3 S., R. 26 E.	.....	418 [b] 160
28	Minaret Creek.....	.....do.....	At meadow near mouth about 1½ miles north of Devil Postpile, Cal.	.....	69
28	Soda Meadow Creek.	.....do.....	Wading near mouth, about ½ mile north of Devil Postpile.	.....	6.9
30	King Creek.....	.....do.....	Wading just below Mammoth trail ford, ½ mile south and 1 mile west of Devil Postpile bridge crossing on main trail from Jackass Meadow to Mammoth Pass.	.....	56
23	North Fork of San Joaquin River.	.....do.....	At Soda Spring, Mount Lyell quadrangle, wading at wagon trail crossing.	.....	594
31	Granite Creek.....	.....do.....	SW. ¼ sec. 5, T. 5 S., R. 25 E. Wading near mouth.	.....	117
31	Little Jackass Creek.	Granite Creek.....	NW. ¼ sec. 5, T. 5 S., R. 25 E	.....	11
15	Jackass Creek.....	San Joaquin River	Wading below ford on McCreary-Shuteye trail, NE. ¼ sec. 2, T 6 S., R. 24 E, Kaiser quadrangle.	.....	58
14	Chiquito Creek....	.....do.....	Wading at Big Shuteye trail ford, Browns Meadow, SW. ¼ sec. 29, T. 6 S., R. 24 E.	.....	190
13	Whisky Creek.....	North Fork.....	Wading above wagon bridge at Cascadel ranch, near North Fork, Cal., SE. ¼ sec. 16, T. 8 S., R. 23 E.	.....	12
13	Cascadel Creek....	Whisky Creek.....	Wading below gage of San Joaquin Light & Power Co. near Cascadel ranch, near North Fork, Cal., SE. ¼ sec. 16, T. 8 S., R. 23 E.	.....	1.4
16	Merced River.....	San Joaquin River.	Old United States Geological Survey gaging station at wagon bridge at Yosemite, Cal.	7.15	2,550
Aug. 18	.....do.....	.....do.....	Wading 500 feet above United States Geological Survey gage at Yosemite, Cal.	3.35	269

[a] Stream was divided into two channels, east channel measured, west channel estimated from measurement made July 26. East channel carried 268 second-feet July 24, and 189 second-feet July 26.
[b] Estimated.

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Miscellaneous measurements in San Joaquin River basin in 1911—Continued.

Main San Joaquin River and tributaries—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
July 16	Tenaya Creek.....	Merced River.....	Old United States Geological Survey gaging station at wagon bridge near Yosemite, Cal.	5.58	325
Aug. 19	.....do.....	.....do.....	Wading 500 feet above United States Geological Survey gage, near Yosemite, Cal.	.....	11
July 16	Yosemite Creek....	.....do.....	Old United States Geological Survey gaging station at wagon bridge, ½ mile from Yosemite, Cal.	8.38	227
Aug. 18	.....do.....	.....do.....	Wading about 200 feet above United States Geological Survey gage at Yosemite, Cal.	.....	12
22	South Fork of Merced River.	.....do.....	Wading above mouth of Big Creek, about ½ mile west of Wawona, Cal.	.....	27
22	Big Creek.....	South Fork of Merced River.	At mouth, about ½ mile west of Wawona, Cal.	.....	20
July 18	Tuolumne River..	San Joaquin River	Highway bridge in Tuolumne Meadows, Mount Lyell quadrangle.	.....	1,250
Aug. 28	South Fork of Tuolumne River.	Tuolumne River..	Wading just above sawmill at Sequoia, Cal.	[a].65	23
28	Middle Fork of Tuolumne River.	South Fork of Tuolumne River.	Wading ½ mile above junction with South Fork below new bridge on San Francisco road, ¾ mile north and ¾ mile east of Colfax Gate, Sonora quadrangle.	.....	9.5
Sept. 22	Mokelumne River[c]	San Joaquin River.	Wading 200 feet below Weather Bureau gage, above power house of Pacific Gas & Electric Co., at Electra, Cal.	.09	44
22	.....do.[b].....	.....do.....	Wading ¼ mile below Pacific Gas & Electric Co.'s power house at Electra, Cal.	.....	253
Oct. 12	.....do.....	.....do.....	Wading 600 feet above power house of Pacific Gas & Electric Co. at Electra, Cal.	.16	51
13	.....do.....	.....do.....	Wading 200 feet below toll bridge on Mokelumne Hill to Jackson, Cal., 1 mile northwest of Mokelumne Hill, Cal.	.....	223
Sept. 23	North Fork of Mokelumne River.	Mokelumne River.	Wading 300 feet below highway bridge 1½ miles northwest of West Point, Cal.	.....	7.4
Oct. 10	Upper flume.....	Diverts from North Fork of Mokelumne River.	At gaging station of Pacific Gas & Electric Co., about 2½ miles northwest of West Point, Cal.	3.78	129
10	Lower flume.....	.....do.....	In flume opposite suspension footbridge about 2½ miles northwest of West Point, Cal.	.....	54
11	South Fork of Mokelumne River.	Mokelumne River.	Wading 300 feet below bridge 1 mile north of Railroad Flat, Cal. [c]	.....	16
Sept. 23	.....do.....	.....do.....	Foot log 200 feet below highway bridge about 2 miles northeast of Glencoe, Cal.	.....	31
Oct. 11	Licking Fork of Mokelumne River.	South Forth of Mokelumne River.	Wading 30 feet below bridge on West Point to Railroad Flat road 1½ miles north of Railroad Flat, Cal. [d]	.....	11
Sept. 23	Middle Fork of Mokelumne River.	.....do.....	Wading 100 feet below highway bridge 1½ miles south of West Point, Cal.	.....	9.3
Oct. 6	Dry Creek.....	Mokelumne River.	Wading 600 feet below mouth of Jackson Creek, 7 miles southwest of Ione, Cal.	.....	8.1
8	Sutter Creek.....	Dry Creek.....	At damsite about ½ mile below Volcano, Cal.	.....	3.5
8	.....do.....	.....do.....	.....do.....	.....	3.3
6	Jackson Creek.....	.....do.....	At mouth, 7 miles southwest of Ione, Cal.	.....	[e]

[a] Gage is ½ inch diameter iron bar, graduated; located on left bank close to a small bowlder and near a cedar tree with dead top, near sawmill.

[b] The difference in discharge above and below the power house, 209 second feet, is the amount of water in the power canal at Electra.

[c] Water surface 2.7 feet below top point of rock in front of 8-inch stump 10 feet below largest rock on left bank.

[d] Water surface 4.88 feet below 8d. nail in south bridge pier, middle of river.

[e] Dry.

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Miscellaneous measurements in San Joaquin River basin in 1911—Continued.

Main San Joaquin River and tributaries—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Aug. 13	Cosumnes River...	Mokelumne River.	Wading below North Fork of Cosumnes River at Huse Bridge, Cal.	.....	35
12	North Fork of Cosumnes River.	Cosumnes River...	At Bucks Bar, Cal.....	.....	25
13	South Fork of Cosumnes River.	.....do.....	Wading just above junction with North Fork of Cosumnes River at Huse Bridge, Cal.	.....	12
Oct. 12	Middle Fork of Cosumnes River.	South Fork of Cosumnes River.	At Bakers Ford, Placerville quadrangle.	.....	19

Miscellaneous measurements in Sacramento River basin in 1911.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Oct. 15	Sacramento River.	San Francisco Bay.	Downstream side of highway bridge of Colusa, Cal.	[a] 1.84	6,470
16	.....do.....	.....do.....	Downstream side of railroad bridge at Knights Landing, Grafton post office, Cal.	[a b] .60	6,100
Dec. 19	.....do.....	.....do.....	.....do.....	[a c] .86	6,450
Aug. 16	Pit River.....	Sacramento River.	Wading, 400 feet above highway bridge at Pitville, Cal., sec. 18, T. 37 N., R. 5 E.	.....	36
May 13	H. M. Wilcox ditch.	Diverts from Hat Creek.	Intake, Hat Creek, Cal., crossing of Hat Creek road.	.....	[d] 49.0
Aug. 15	.....do.....	.....do.....	Wading, 30 feet below head gates above Hawkins' ranch near Hat Creek, Cal.	.....	39.4
May 13	H. Morris ditch....	.....do.....	300 feet below intake at Hat Creek,	.....	[e] 12.2
	L. H. Sullivan et al., ditch.	.....do.....	.....do.....	.....	[e] 8.3
	Olive Opdyke ditch.	.....do.....	600 feet below intake, Hat Creek, Cal.	.....	[e] 5.0
	M. A. Reives ditch.	.....do.....	900 feet below intake, Hat Creek, Cal.	.....	[f] 12.0
	Anderson et al., ditch.	.....do.....	Intake, Hat Creek, Cal.....	.....	[g] 9.6
	Anderson et al., lateral.	.....	.....do.....	.....	[h] 7.4
	O. R. L. lateral to Anderson et al., ditch.	.....	Head gate, Hat Creek, Cal.....	.....	2.2
	P. M. Honn ditch..	.....do.....	.....	.....	[i] 4.8
Aug. 12	Nelson Creek.....	Pit River.....	Wading 400 feet above mouth and 80 feet below highway bridge ¾ mile above Henderson, Cal., sec. 31, T. 37 N., R. 1 E.	.....	30
11	Hatchet Creek.....	.....do.....	Lower road crossing, Montgomery Creek to Henderson, Cal., sec. 24, T. 35 N., R. 1 W.	.....	[k] 40
11	Roaring Creek.....	Hatchet Creek....	Lower road crossing, Montgomery Creek to Henderson, Cal., sec. 14, T. 35 N., R. 1 W.	.....	[k] 18
May 25	Squaw Creek.....	Pit River.....	Wading ½ mile below Winthrop, Cal.	[l] 5.00	270

[a] Weather Bureau gage.
[b] Southern Pacific Co.'s gage read 23.40 feet.
[c] Southern Pacific Co.'s gage read 23.60 feet.
[d] Very nearly ½ of flow immediately returns to creek; ½ used for irrigation eventually returns in several streams.
[e] No waste returns to Hat Creek above regular gaging station.
[f] About ⅔ of flow wastes back into creek.
[g] 7.0 second-feet returns to creek.
[h] About 2 second-feet wastes back into creek.
[i] Diversion from an old channel of Hat Creek; ⅔ of flow wastes back into this channel and returns to main creek.
[k] Estimated.
[l] Gage height observed on June 24, 1911, was 4.3 feet.

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Miscellaneous measurements in Sacramento River basin in 1911—Continued.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Sept. 29[a]	Cow Creek	Sacramento River.	Wading 300 feet below bridge, 1 mile east of Millville, Cal., sec. 14, T. 31 N., R 3 W.	.....	70
Aug. 18	North Fork of Cow Creek.	Cow Creek	Wading 150 feet above highway bridge, about 11 miles northeast of Millville, Cal., sec. 16, T. 32 N., R. 3 W.	.....	54
18	Canal, diverting from North Fork of Cow Creek.	.....	Road crossing 10 miles northeast of Millville, Cal., near Basin Hollow, sec. 20, T. 32 N., R. 1 W.	.....	12
10	Little Cow Creek	Cow Creek	Wading 6 feet below lower side of bridge, stage road crossing on road from Oak Run to Buzzards Roost, Cal., sec. 4, T. 33 N., R. 1 W.	(b)	7.0
11	Terry Lumber Co.'s flume.	(c)	½ mile above Buzzards Roost, Cal.	.....	19
Sept. 29	Bear Creek	Sacramento River.	Wading 50 feet below bridge, 2 miles north of Balls Ferry, sec. 15, T. 30 N., R 3 W.	.....	40
Oct. 12	Cottonwood Creek	.....do	Wading 7 miles above Cottonwood, Cal.	.....	28
Aug. 19	Battle Creek	.....	Wading just below new power house of Northern California Power Co., 5 miles southeast of Balls Ferry, Cal.	.....	352
22	Antelope Creek	Sacramento River.	Wading ½ mile above dam of Red Bluff City water works, about 10 miles east of Red Bluff, Cal., sec. 1, T. 29 N., R. 3 W.	.....	50
Oct. 9	.....do	.....do	Wading 200 feet below old power dam near mouth of canyon, near Red Bluff, Cal.	.....	83
Aug. 24	Deer Creek	.....do	Wading 120 feet below sheep bridge near mouth of canyon, about 8 miles northeast of Vina, Cal., sec. 23, T. 25 N., R 1 W.	.....	156
Sept. 11	Indian Creek	North Fork of Feather River.	Wading about 1,000 feet above intake of Taylorsville mill race at Taylorsville, Cal.	.....	[d] 52
11[e]	Taylorsville mill race.	Diverts from Indian Creek.	Wading 500 feet below intake at Taylorsville, Cal.	.....	33
18[f]	South Fork of Feather River.	Middle Fork of Feather River.	Wading 75 feet below highway bridge at Enterprise, Cal., sec. 1, T. 19 N., R. 6 E.	.....	2.2
18	Palermo Land & Water Co. ditch.	Diverts from South Fork of Feather River.	In flume at Enterprise, Cal.	.....	37
Aug. 18	South Fork of Yuba River.	Yuba River	At Emigrant Gap, Cal.	.....	[g] 2
15	Bear River	.....	Below Pacific Gas & Electric Co.'s diverting dam, near Colfax, Cal.	.....	12
Sept. 28	.....do	.....	.....do	.....	18
Oct. 20	.....do	.....	.....do	.....	2.1
Sept. 28	Pacific Gas & Electric Co.'s canal.	Bear River	Made in flume of Pacific Gas & Electric Co., 600 feet below dam, near Colfax, Cal., sec. 22, T. 15 N., R. 9 E.	2.87	46
Oct. 29	Kelsey Creek	Clear Lake	Highway bridge at Kelseyville, Cal. (head of Cache Creek).	.....	[h]
30	Seigler Creek	Cache Creek	At mouth at Lower Lake, Cal.	.....	[g] ½

[a] Made by Irrigation Investigations, United States Department of Agriculture.
[b] Water surface 2.10 feet down from top of nail head near upstream end of bridge pier on left bank (nail projects ¼ inch).
[c] Diverts water from Montgomery Creek into Little Cow Creek.
[d] Total flow available at Taylorsville.
[e] This ditch is now used to divert water for irrigation in Indian Valley.
[f] The measured flow of Palermo Land & Water Co. ditch, which diverts from South Fork of Feather River 1½ miles above the bridge should be added to give total normal flow. There is some small leakage through dam, some waste from ditch, and also some water enters from two small streams, nearly dry, between point of diversion and bridge.
[g] Estimated.
[h] Dry.

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Miscellaneous measurements in north Pacific Ocean drainage basins in 1910–11.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
1910.					
May 17[a]	Russian River	Pacific Ocean	Wading 200 feet above East Fork Russian River, 3 miles north of Ukiah, Cal.		19
July 5[a]	do	do	Wading 100 feet above East Fork of Russian River, 3 miles north of Ukiah, Cal.		2.8
May 16[a]	do	do	Wading 200 feet south of telephone crossing, 1 mile east of Ukiah, Cal.		96
1911.					
May 29[a]	do	do	do		229
Aug. 30[a]	do	do	Wading 200 feet below dridge, 3 miles southeast of Ukiah, Cal.		6
1910.					
May 18[a]	do	do	Wading 700 feet above bridge, ½ mile west of Hopland, Cal.		238
19[a]	do	do	Wading 100 feet south of south end of pile bulkhead, 1 mile north of Cloverdale, Cal.		289
1911.					
Aug. 29[a]	do	do	Wading at bridge, 4 miles north of Healdsburg, Cal.		17
1910.					
May 20[a]	do	do	Wading 1,000 below highway bridge, at Healdsburg, Cal.		348
17[a]	East Fork of Russian River.	Russian River	Wading 200 feet above mouth, 3 miles north of Ukiah, Cal.		207
July 5[a]	do	do	Wading 100 feet above mouth, 3 miles north of Ukiah, Cal.		22
1911.					
Nov. 2	Ackerman Creek	do	Wagon bridge near mouth, about 2 miles north of Ukiah, Cal.		(b)
2	Orr Creek	do	Wagon bridge near mouth, about ½ mile north of Ukiah, Cal.		(b)
Oct. 29	Pieta Creek	do	Near mouth, about 1 mile south of Pieta, Cal.		c 2
1910.					
May 25[a]	Kellogg Creek	do	Wading 100 feet below mouth of Yellowjacket Creek at Kellogg, Cal.		2.6
July 12[a]	do	do	do		.7
May 25[a]	Yellowjacket Creek	Kellogg Creek	Wading 50 feet above Chas. Foote's dam, 1 mile east of Kellogg, Cal.		2.7
Aug. 13[a]	do	do	do		.7
13[a]	Mill Creek	do	Wading 1 mile above mouth, 1 mile north of Kellogg, Cal.		.8
1911.					
Nov. 20	Honey Dew Creek	Mattole Creek	Wading at mouth, sec. 6, T. 3 S., R. 1 E., H. M.		13
21	Squaw Creek	do	Mouth, sec. 30, T. 2 S., R. 1 W., H. M.		c 2
22	North Fork of Mattole Creek.	do	Ford near mouth, sec. 4, T. 2 S., R. 2 W.		c 3
22	Davis Creek	Pacific Ocean	Road crossing near mouth, sec. 13, T. 1 S., R. 3 W.		c ½
22	Bear River	do	Near mouth, Capetown, Cal., sec. 13, T. 1 N., R. 3 W., H. M.		c 5
1905.					
Sept. 3[d]	South Eel River	Eel River	Just above Preston, Mendocino County, Cal.		5.5
1911.					
Nov. 4	Tomki Creek	South Eel River	Road crossing on road from Willits to Hearst, Cal., sec. 26, T. 19 N., R. 13 W.		(b)
5	Burger Creek	Eel River	Bridge on road between Laytonville and Covelo, Cal., sec. 10, T. 21 N., R. 14 W.		c ½
16	do	do	do		c 1
19	Redwood Creek	South Fork of Eel River.	Briceland, Cal., sec. 18, T. 4 S., R. 3 E.		c ½
Sept. 22	Healy Creek	Van Duzen River	Near mouth, wagon bridge on road from Carlotta to Bridgeville, Cal.		c .1
Oct. 19	do	do	do		c .2
Sept. 22	Grizzly Creek	do	Near mouth, bridge on road from Carlotta to Bridgeville, Cal.		c ½
Oct. 19	do	do	do		c ½

[a] Made by United States Department of Agriculture, Irrigation Investigations.
[b] Dry.
[c] Estimated.
[d] Furnished by Snow Mountain Water & Power Co.

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Miscellaneous measurements in north Pacific Ocean drainage basins in 1910–11—Contd.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
1911.				*Feet.*	*Sec.-ft.*
Sept. 21[a]	Lawrence Creek	Yager Creek	500 feet below Booth Run, Cal.	.....	1.5
19[a]	Mad River	Pacific Ocean	Wading just below mouth of Bug Creek, sec. 9, T. 3 N., R. 4 E.	.....	4.6
4	Little River	....do....	Railroad bridge, about 5½ miles southeast of Trinidad, Cal., sec. 9, T. 7 N., R. 1 E.	.....	[b] 3
Nov. 29	....do....	....do....	Wagon bridge, about 3 miles southeast of Trinidad, Cal., sec. 6, T. 7 N., R. 1 E.	.....	[b] 2
Sept. 5	Maple Creek	Big Lagoon	Wagon bridge, sec. 20, T. 9 N., R. 1 E.	.....	[b] 1
Nov. 29	....do....	....do....	....do....	.....	[b] 1
Sept. 5	McDonald Creek	Stone Lagoon	Wagon bridge, sec. 29, T. 10 N., R. 1 E.	.....	[b] ½
4	Minor Creek	Redwood Creek	Mouth, sec. 28, T. 7 N., R. 3 E.	.....	[b] ½
Oct. 14	....do....	....do....	....do....	.....	[b] ½
Sept. 5	Prairie Creek	....do....	Wagon bridge at Prairie, Cal., sec. 2, T. 11 N., R. 1 E.	.....	[c]
Nov. 29	....do....	....do....	....do....	.....	[b] 2
Aug. 22[d]	Shasta River	Klamath River	Wading 150 feet below Southern Pacific Railroad bridge, 2 miles south of Montague, Cal., sec. 33, T. 45 N., R. 6 W.	.....	111
21[d]	Little Shasta River.	Shasta River	Wading, 1½ miles northeast of Little Shasta, Cal., sec. 17, T. 45 N., R. 4 W.	.....	7.2
Sept. 3	Siskiyou Electric Co. ditch.	Diverts from Shasta River.	900 feet below diversion dam, 4 miles north of Yreka, Cal.	.....	107
Apr. 10	Scott River	Klamath River	Highway bridge, 1 mile below Callahan.	[e]	372
May 30	....do....	....do....	....do....	[f]	575
Sept. 20	....do....	....do....	....do....	[g]	17
Nov. 1[d]	....do....	....do....	Wading at bridge, 3 miles north of Callahan.	.....	14
Aug. 30[d]	....do....	....do....	Wading 150 feet above bridge, 7 miles west of Fort Jones, Cal., sec. 26, T. 44 N., R. 10 W.	.....	40
Sept. 8	Indian Creek	....do....	Highway bridge at Happy Camp, Cal., sec. 11, T. 16 N., R. 7 E.	[h]	[i] 52
Aug. 24	Trinity River	....do....	Wading ¼ mile above mouth of North Fork of Trinity River near Helena, Cal., sec. 33, T. 34 N., R. 11 W.	.....	220
20	Trinity Land & Cattle Co. ditch.	Diverts from East Fork of Trinity River.	About 450 feet above road crossing about 3 miles southeast of Trinity Center, Cal.	1.62	11
21	Stewarts Fork of Trinity River.	....do....	Wading ¼ mile above mouth, about 600 feet below mouth of Buckeye Creek and below a ditch diversion, 1½ miles south of Milnerville, Cal.	.....	32
Sept. 30	....do....	....do....	....do....	.....	33
29	Canyon Creek	....do....	Wading 600 feet above highway bridge about 1½ miles north of Junction City, Cal., sec. 36, T. 34 N., R. 11 W.	.....	6.8
30	Canyon Creek ditch.	Diverts from Canyon Creek.	Intake 500 feet above highway bridge, about 1½ miles north of Junction City, Cal.	.....	4.6
Aug. 25	Hay Fork of Trinity River.	South Fork of Trinity River.	Below junction with Salt Creek, sec. 10, T. 31 N., R. 12 W.	.....	3.4
25	Salt Creek	Hay Fork of Trinity River.	Mouth, sec. 10, T. 31 N., R. 12 W.	.....	.5
Oct. 7	Willow Creek	Trinity River	Wading 200 feet below bridge near mouth at China Flat, Cal., sec. 29, T. 7 N., R. 5 E.	[j]	7.3
Dec. 30	....do....	....do....	Wading 500 feet below bridge at China Flat, Cal.	[k]	36

[a] Made by R. L. Thomas, City Engineer of Eureka, Cal.
[b] Estimated.
[c] Dry.
[d] Made by United States Department of Agriculture, Irrigation Investigations.
[e] Water surface 13.78 feet below top of steel chord at second vertical from right abutment, upstream side.
[f] Water surface 13.37 feet below same reference point as used Apr. 10, 1911.
[g] Water surface 15.14 feet below reference point.
[h] Water surface 22.88 feet below small nail, upstream end of second floor beam from right abutment.
[i] About 8 second-feet diverted out of Indian Creek watershed for placer mine about ½ mile below Happy Camp on Klamath River.
[j] Water surface 2.00 feet below paint mark on rock under left nd of br dge.
[k] Water surface 1.64 feet below reference point established Oct. 7, 1911.

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Miscellaneous measurements in north Pacific Ocean drainage basins in 1910–11—Contd.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
1911.				*Feet.*	*Sec.-ft.*
Oct. 9	Campbell Creek....	Trinity River.....	Road crossing near mouth near south boundary of Hoopa Indian Reservation.	.....	[a]2
Dec. 30	.....do.....	.....do.....	.....do.....	.....	[a]½
Oct. 9	Hospital Creek....	.....do.....	Mouth near Hoopa, Cal.....	.....	[b]
Dec. 30	.....do.....	.....do.....	.....do.....	.....	[a]3
Oct. 9	Supply Creek.....	.....do.....	Wading at bridge near Hoopa, Cal..	[c]	3.7
Dec. 29	.....do.....	.....do.....	Wading 1,200 feet above mouth, near Hoopa, Cal.	.....	25
14	Prairie Creek.....	Hunter Creek.....	Highway bridge about ½ mile northeast of Requa, Cal., above mouth, sec. 33, T. 14 N., R. 1 E.	.....	[a]5
Nov. 29	Wilson Creek.....	Pacific Ocean.....	Road crossing about 4½ miles northwest of Requa, Cal., sec. 18, T. 14 N., R. 1 E.	.....	[a]½
Sept. 7	Mill Creek.....	Smith River.....	Highway bridge near mouth on road from Crescent City to Gasquet, Cal., sec. 19, T. 16 N., R. 1 E.	.....	[a]4
Dec. 1	.....do.....	.....do.....	.....do.....	.....	[a]2

[a] Estimated.
[b] Dry.
[c] Water surface 1.00 foot below paint mark on bowlder under right end of bridge.

Miscellaneous measurements made in Klamath River drainage basin, 1910–11.

Date.	Stream.	Tributary to—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Apr. 21, 1910[a]	Miller Creek.....	Williamson River.....	Fish Lake, Oreg.....	.....	9.9
Sept. 1910[a]	.....do.....	.....do.....	.....do.....	.....	3.3
Nov. 14, 1911	.....do.....	.....do.....	Beaver Marsh, Oreg....	0.92	10.3
16, 1911	Sand Creek.....	.....do.....	Near Chiloquin, Oreg....	.....	14.5
Aug. 3, 1911	Fort Creek.....	Wood River.....	Near Fort Klamath, Oreg.	.....	82.8
3, 1911	Crooked Creek.....	.....do.....	Near Klamath Agency, Oreg.	.....	106
5, 1911	Crane Creek.....	.....do.....	Near Fort Klamath, Oreg.	.....	10.4
5, 1911	Sevenmile Creek.....	Upper Lake.....	.....do.....	.....	100
5, 1911	Rock Creek.....	.....do.....	Near Pelican, Oreg.....	.....	8.4
May 15, 1909	Fourmile Creek.....	.....do.....	At Fourmile Lake, Oreg	.....	40
June 18, 1909	.....do.....	.....do.....	.....do.....	.....	63
Aug. 14, 1909	.....do.....	.....do.....	.....do.....	.....	2
May 20, 1910	.....do.....	.....do.....	.....do.....	.....	60
June 17, 1910	.....do.....	.....do.....	.....do.....	.....	5
Mar. 20, 1911	Surface water.....	Lost River.....	Clear Lake, Oreg.....	.....	144
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[a] Float measurements. Coefficient to reduce surface velocity to mean=.82.

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